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of the Amateur Entomologists' Society

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The Amateur Entomologists' Society

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The AES • P.O. Box 8774 • London • SW7 5ZG

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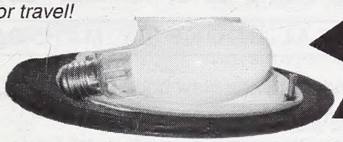

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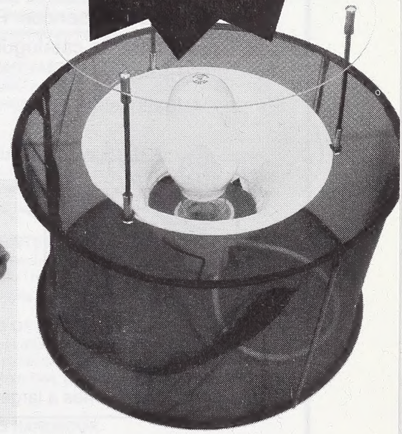

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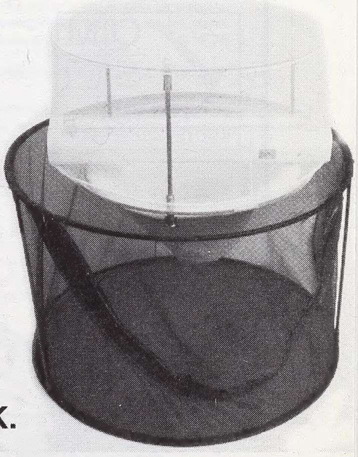

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The AES Bug Club is for young people or the "young at heart" who find insects and other creepy crawlies interesting and even fascinating.

As the junior section of the AES we are devoted to promoting invertebrates to the younger generation who, afterall, will be the entomologists of tomorrow!

You can help us in a number of ways, for example: by joining the Bug Club yourself, getting someone else to join the Bug Club, promoting the Bug Club and AES to your local school/Scout or Guide Group etc, running a Bug Club event or writing an article for our exciting newsletter. If you can do anything to help then please write to us: **AES Bug Club, PO Box 8774, London, SW7 5ZG**.

Membership details can be found in the front of this Bulletin.

Due to an unfortunate error during the printing processes the cover picture became orientated incorrectly. It should be viewed as shown above.

The cover of the *Bulletin* features *Eristalis nemorum* (L.). Two males courting a single female.

This species of drone fly can show some variation of colour – the abdomen can range from dark to quite brightly coloured. The stigma on the wings is very small and dark brown and the black face stripe is well-developed. It is probably one of the commonest Drone-flies occurring throughout Britain in a wide range of habitats, though it prefers more open areas, such as fields, meadows and wastelands. It is found from April to September. The larvae occur in water with a very high organic content, such as farmyard drains.

Photo: Nick Holford.

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From The Registrar

Data Protection Act – In order to fulfil the requirements of this Act I must advise members of the details held on computer database and the use made of them.

Currently the information we hold comprises – name, address, telephone number, e-mail address, date of birth, interests, payments made, and membership category. Additional information is held regarding mailing details, correspondence etc. If any member objects to these details being held, would they please get in touch with me.

The information is used for the following purposes:-

To prepare mailing labels for the ***Bulletin*** and ***Bug Club Newsletter***. Also labels for other mailings and correspondence as required.

For the preparation of statistics for use by the Council.

The publication of Membership Lists. These will only include details of name, address, interests, and, in the case of Junior Members, the Membership Class. Please note that telephone numbers and e-mail addresses are ONLY passed on to Council and Committee members when a specific request is made. Such details are not passed to other members. **Individual members may request specific lists**, such as names and addresses of members in a specific area, with or without interests included. A minimum charge of £1.50 is made to cover the additional costs of stationery and postage involved.

Membership List – it is now possible to produce a Membership List whenever one is required and it is hoped to produce one as soon as adequate funds are available (production costs over £2,000). It should include an alphabetical list of names and addresses. It is should also include a list of members' names under specific interests, and members' names in individual countries and UK counties. (It is for the latter reason that county name is always included in the address, despite it not being essential in most cases.) The restriction to only three named interests is to make the interest lists manageable, since these will help members communicate with others of similar **main** interest areas. I must emphasise that the ONLY reason a list has not been produced is that of cost.

Change of Address – the mailing labels are produced a month in advance in order to notify the printer as to how many of each publication need be printed and to allow sufficient time for the envelopes to be prepared. (This is a more tedious task than previously because there are at least three different categories of mailing – ***Bulletin*** alone, ***Bulletin*** plus ***Bug Club Magazine*** together (for family membership), and ***Bug Club Magazine*** alone. These are further separated into Overseas and UK.) This can mean that if I am notified of the change of address AFTER the mailing labels are produced, then the mailing will go to the previous address and there is **no way of preventing this**. It also means that if a redirected envelope is used to notify change of address, by the time I receive it via the PO Box, which can take up to four weeks, or even more, the next mailing label will also have been produced for the previous address! It is therefore in members' interests to notify me as to the new address, and the date for which it becomes effective, as soon as possible after the details are known to the member. Members may notify me directly to my home address, if they wish – Nick Holford, 8 Ruddle Way, LANGHAM Rutland, LE15 7NZ (Tel. – 01572 723532). I can also be contacted by e-mail (nick@fivecon.force9.co.uk). In notifying change of address, please be certain to include your membership number, which is printed after the name on the mailing label. This makes finding your record much easier. On one occasion I had a member notify me of change of name on marriage, plus change of address, but giving me neither the previous name nor the previous address. I eventually managed to trace the record by using the member's initials, though this did take quite a time! Without the computer database, it would have been more or less impossible.

First names – I am trying to make communications more personal by using first names. This is already done in most cases. Please try to remember to write it onto the renewal slip before sending it in.

Payment by cheque – when paying by cheque, if the member's family name is different from that on the cheque, please write the member's name on the back as this helps considerably when checking that payments have been entered correctly. It would be helpful if the membership number were written on the back as a matter of course. PLEASE do not staple cheques to the form, these require a considerable amount of time to remove, and when dealing with about 1400 cheques in the space of two months, any saving in time is a great boon! Thank you.

Nick Holford, Registrar

Southern France, mid September, 2002

by Matthew Rowlings (9108)

29 Woodpath, Southsea, Portsmouth, Hampshire, PO5 3DX.

Fifty-five was the species count for my three-day trip to southern France in September 2002. This was much higher than expected given the time of the year. The count was probably so high as I was roaming widely looking for sites containing Chalk Hill Blues (*Lysandra coridon*), hoping to separate the very similar (but, allegedly, not identical) Provence Chalk Hill Blue (*L. hispana*). The former species is very widely distributed across Europe, but the latter is a strictly Mediterranean species confined to the coasts of northern Spain, France and north-west Italy, extending inland locally. The flight times differ too, the latter is double brooded, flying in May/June, August/ September, the former is single brooded flying July through to October, presumably depending on location and altitude. I either a) failed to convince myself that these two species can be separated, or b) simply failed to find any of the supposedly widespread Provence Chalk Hill Blues. I am very hopeful that a site at 350m, which contained a few Chalk Hill Blues, will prove to harbour the Provence Chalk Hill Blues. This was by far the lowest, driest, hottest location at which I found these species, so the chance that somehow Chalk Hill Blues had survived this late in the seasons seemed rather unlikely. A return trip in spring, well before the Chalk Hill Blue starts flying, might resolve this issue!

Saturday 26th April, 2003

The Bartlett Room, London Zoo,
Regent's Park, London.

SEE INSIDE BACK COVER FOR FURTHER DETAILS

Expansions in the range of *Volucella zonaria* (Poda, 1761) and *V. inanis* (L., 1758) (Diptera: Syrphidae)

by Roger K.A. Morris[1] and Stuart G. Ball[2]

[1] *c/o 241 Commonside East, Mitcham, Surrey CR4 1HB.*

[2] *255 Eastfield Road, Peterborough, Cambs.*

Introduction

Many readers in southern England will be familiar with the hornet mimic *Volucella zonaria*, and its near relative *V. inanis*. They are amongst our largest and most spectacular hoverflies. *Volucella zonaria* has a chestnut thorax and black and gold abdomen, making it a good hornet mimic. *V. inanis* is smaller and yellower, and is more wasp-like. The principal differences between the two are given in Table 1. Good illustrations can be found in Colyer & Hammond (1968), Stubbs & Falk (1983) and Gilbert (1993). With a bit of experience and caution, both can be identified with confidence, but size alone is no guarantee – there are often small *V. zonaria*, especially males, that can cause problems. Both have shown evidence of considerable extensions of range in recent years that have prompted us to look at their historical occurrence in southern England (Morris & Ball, a & b *in press*). These studies have highlighted a longer period of change amongst both species than was previously realised. They illustrate the opportunities for ongoing studies to follow their fortunes and the possibility of involving a wide audience of recorders.

Table 1. Comparative features of *Volucella inanis* and *V. zonaria*.

Volucella inanis	*Volucella zonaria*
Thorax with yellowish stripes over black background.	Thorax with chestnut stripes over black background.
Scutellum yellowish	Scutellum chestnut
2nd tergite with yellow markings, black bar narrow.	2nd tergite with chestnut markings, black bar broader.
Wing bases lightly yellow, wing with a pronounced stigma and cloudiness at wing tip	Wings strongly yellowish without darkened stigma but clouding towards the wingtip
Sternite 2 yellow (underside of abdomen)	Sternite 2 black (underside of abdomen)
Smaller – wing length 12.25 – 14.25mm.	Larger – wing length 15.5 – 19.5mm.

Volucella zonaria

In the early years after its arrival in the 1940s there were regular reports of specimens in the entomological press, but surprisingly few were noted in the AES *Bulletin*. Since the 1960s there have been very few published accounts and after the 1970s most records have been supplied directly to the Hoverfly Recording Scheme. However there must be many observers who recognise this hoverfly and do not consider it noteworthy (e.g. Wurzell, 1980), or are not aware of the Recording Scheme and don't forward records. This is unfortunate because more detailed recording might have helped us to understand why such changes are taking place. This expansion in range is demonstrated by comparison between maps 1 and 2, which shows contrast in distribution between the period to 1989 and that from 1990 to 2001.

The reasons behind such an expansion in range are complex, and we cannot ignore the possibility that many unusual records are of primary migrants. Indeed there are reports that might support such conjecture (e.g. Gardiner, 1991; George, 1991). However, our investigations also identify a clear link between the range of *V. zonaria* and a combination of mean winter temperatures (1°C and over) and mean summer temperatures (20.5°C and over) (Morris & Ball, *in press* a.). Climate change means that the extent of such conditions is changing and there are reasons to believe that they will be followed by a predictable expansion in the range of *V. zonaria*.

We are therefore very keen to encourage more detailed recording of *V. zonaria*. All records from all sites (Grid ref. + dates) would be helpful, especially if accompanied by notes on flower visits, numbers of individuals and the ratio between males (eyes touching) and females (eyes separated). Furthermore, we would welcome breeding records of larvae from wasps' nests. At the moment, we are only aware of records from the common wasp *Vespula vulgaris*, but it may be associated with other species.

Volucella inanis

In the early 20th Century this species was known as a rare southern and western species that was occasionally numerous at certain locations (Verrall, 1901); since then it has seemingly contracted its range away from south-west England and has consolidated and expanded its range in south-east England. Today, it is widely distributed and common in London and the Home Counties, occurring more widely in open countryside than *V. zonaria*.

Map 1. Records of *V. zonaria* to 1989.

Map 2. Distribution of *V. zonaria* 1990-2001.

Map 3. Records of *V. inanis* to 1989 (open circles = records prior to 1970).

Map 4. Distribution of *V. inanis* 1990-2001.

In 2001, it became apparent that *V. inanis* was undergoing a remarkable expansion in range. Records from as far afield as Peterborough, Northampton, Leicester and Nottinghamshire showed that something very unusual was occurring. However, it now becomes apparent that a change in range was already underway in the 1990s that had been masked by the production of a simple distribution map (Ball & Morris, 2000). Maps 3 and 4 show the contrasts between its distribution from 1970 to 1989 and from 1990 and 2001.

The larva of *Volucella inanis* is predatory within nests of common wasps (*Vespula* spp.) and hornets (*Vespa crabro*), and it is possible that the expansion of this species is at least in part the result of favourable conditions for the hornet, which has had a number of successful years. However, we also believe that there are particular climatic factors that dictate its range but unlike *V. zonaria*, we are unable to offer a definitive link. It is also possible that this species population is bolstered by migration from the Continent.

As with *V. zonaria* we would like to alert observers to the possibility that this species may occur away from its traditional haunts and to the value of submitting all records. The general principles of recording outlined for *V. zonaria* apply to *V. inanis* as we seek similarly detailed information.

How will the data be used?

In the two accounts we have submitted this year, we have set a baseline against which any changes in the distribution of these hoverflies may be compared. It is anticipated that updates reports will be published when appropriate. Given sufficient interest, we will supply update maps to keep recorders informed. Data can be forwarded to Roger Morris at roger.morris@english-nature.org.uk.

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Gardening for Insects: The Joy of Herbs

by Jackie Wilkins

78A New Dover Road, Canterbury, Kent, CT1 3EQ.

The weather may be cold and dark outside on this mid January day but it does not stop the image of that hot, hazy summer's day last year. The bees buzzing happily over the herb patch in the garden, only a little annoyed to be disturbed as I snip off some borage flower heads to add to a cooling summer drink.

Herbs are such a pleasure to have and to grow. You don't even need a garden. They can be grown in pots, containers or grow bags. These can be placed on a patio, a balcony, in a yard or even on a windowsill. They are a useful and tasty addition to food and often have beneficial effects. Many have sweet smells that give additional soothing pleasures. To add to all this they are beloved by many of the beneficial insects that we need to encourage.

The flowering of marjoram, the various thymes, balms, mints seem to excite the bees, butterflies, hoverflies, moths, wasps. *Vespula vulgaris* (common wasp), *Cynthia cardui* (Painted Lady butterfly), *Aglais urticae* (Small Tortoiseshell), *Vanessa atalanta* (Red Admiral), *Inachis io* (Peacock), *Polygonia c-album* (Comma) are all regulars at my herb patch. They dart around in a seemingly distracted way making it difficult but interesting to identify the various species. The taller flowering aromatic lavenders and rosemary plants encourage the busy bumble bees – *Bombus lucorum* (Small Earth Bumble Bee), *B. hortorum* (Small Garden Bumble Bee) to join the host of nectar-sipping insects. Chive and parsley flower heads, hyssop, sweet cicely, woodruff and the tall short lived perennial angelica are all excellent plants for insects to forage amongst – ladybirds, *Clytus arietis* (Wasp Beetle), *Pyrochroa coccinea* (Cardinal Beetle), *Rhagonycha fulva* (Soldier Beetle).

I have mentioned just some of the more well known herbs for you to enjoy. There are many more for you and the insects to enjoy.

Farewell from Marris House Nets

by R. (Bob) George, F.R.E.S., F.L.S.

54 Richmond Park Avenue, Bournemouth BH8 99R.

Perhaps it isn't quite as bad as that. However, to put things into their full context I'm going to do a kind of autobiography, so please be patient.

As a kid I was thoroughly interested in anything in the garden, in the countryside, everywhere. I had collections of lepidoptera, spiders (which rotted), birds' eggs, pressed flowers. I kept rabbits; aquaria in which I had sticklebacks, newts and tadpoles; fossils from the Cotswolds; mosses; anything that took my fancy. Those were the days when every buddleia bush was covered with small tortoiseshells, peacocks and red admirals, when small and large whites swarmed my father's cabbages and at night the garden was full of moths. With my pals, living on the southern edge of Gloucester city, we had a round of at least a dozen ponds and a couple of streams. From these we got smooth newts, palmate newts and from one, lots of great crested newts (Sallies we called them). They yielded common sticklebacks (one had nine-spined sticklebacks), frogs and toads galore. Now not one of these watery sites is left. There is a plethora of housing estates, industrial estates, roads, the cut grass mono-culture of school playing fields and none of the lovely flower filled meadows in which we roamed. In my two years in the sixth form of the Crypt School I recorded 500+ species of flowering plants. My lists and site records were used by the authors of the *Flora of Gloucestershire*.

Then the war came and natural history came second to other activities. Pilot training in Florida and Alabama gave me the chance to see many new plants. Back in England, flying Proctors (at RAF Cranwell), giving u/t wireless operators and navigators their first flights, then more training and posting to 616 Squadron Royal Auxiliary Air Force at RAF Ibsley about ten miles north of my present home in Boumemouth. From there I flew Spitfire VI, then off to RAF Exeter to fly Spitfire VII (the old pilot's dispersal hut is still there). We went to RAF Fairwood Common on the Gower for a gunnery course where I earned a reputation as an eccentric because I filled the dispersal room with jars of named local wild flowering plants. Fortunately the C.O. was quite amiably amused. About a year later I went to RAF Farnborough to convert into prototype Meteors. A few weeks later my Squadron became the first jet squadron in the RAF. After a little while and a lots of moves we got to Lubeck – Blankensee just as the war ended and a

little leisure came into our lives except when the Russian ack-ack shot at us whilst we were in the landing circuit – they missed! Lots of swallowtails – lovely; umpteen millions of mosquitoes – absolute hell. Two or three times a week I went fishing for bream at the local small lake. To hire a punt to get outside the rushes cost me two cigarettes per afternoon. The locals were delighted with my catch, usually about 50 pounds, fresh food was very short.

Back to England and I declined a permanent commission in the peace-time RAF and then to teachers' training college. After a little touring around I became, in 1951, junior science master at my old school, the Crypt. By this time I was collecting beetles and still accumulating a few mosses (but I never could get on with them). I started working through the British entomological literature. This was primarily to find references to Gloucestershire beetles. Of course, masses of references to other insect orders turned up, so I kept a card index of the lot. By 1977, with the wonderful help of the Librarian of the Royal Entomological Society I had finished all of our main journals, current and defunct, and the journals of Gloucestershire societies. The index now resides in the Gloucester City Museum along with my mosses.

During my time at the Crypt I resurrected the Natural History Society and organised coach trips to several good sites particularly Coombe Hill Canal, now a reserve of the Gloucestershire Trust for Nature Conservation, and Cannop Ponds in the Forest of Dean. Often we were accompanied by Harold Peacey whose consuming interest was Trichoptera though he was a dab-hand at micro-lepioptera. I lost contact with him. Does anyone know what happened to him?

We lived in a flat above a shop in central Gloucester. My beetle collection was filling all spare space and it seemed that we were on the main route for mice who had got fed up with good food in the cafeteria next door to the south and the butcher's shop on our northside when they wanted a protein diet. Three mouse traps caught thirty five mice in three days. From one I got 15 fleas some of which were *Nosopsyllus londiniensis*, the eighth locality in the UK. They were identified by my very good friend, Frans A.G.M. Smit, who wrote a short paper on them. He and Miriam Rothschild gently pressurised me and I converted to fleas and, much more than less, have been with them ever since.

Whilst at the Crypt my pupils gave me a great deal of help with fleas and corpses. One of them was Britain's second Bechstein's Bat which carried its parasitic fly *Basilia nana*. Their help enabled me to write my first paper – The Siphonaptera of Gloucestershire – a task which was

helped by my card index of Gloucestershire references. I also used the index, and the enthusiasm of many of my pupils, to work on several groups of invertebrates and began to create "basic" County Lists, bringing together all the existing records plus a few contemporary records with aid of very willing national experts. These lists were intended to be foundations for workers embarking on the animals concerned, saving them the literature research time. They included lists of Gloucestershire thrips, lice, aphids, spiders, false-scorpions, harvestmen, orthopteroids, and of course, fleas. I persuaded H.M. Hallett to do a list of Gloucestershire aculeates.

Some years later there was a hiatus when I felt I needed a change and a need to look at Chalcids. During a visit to the British Museum (Natural History) – that much loved title – I mentioned this to Gerry Tremewan. He took me to Dr John Noyes. I was told I must be mad but also that I needed a Malaise Trap. The conversation went something like this:

Me – "What's a Malaise Trap?"

John – (produced one).

Me – "Where can I get one?"

John – "You can't, no one makes them."

Me – "But you have them made."

John – "Yes, our technicians do but thoroughly dislike the job and charge us – the collecting department, £60 a time (this was in about 1976) and we would buy from anyone who could make them cheaper."

Me – "Perhaps I could."

John – "Here is a pattern – let us know."

So after chatting to several people in my evening school classes (I was at a Cambridgeshire Village College then) and my bank manager, the idea of Maris House Nets began. I was living in Maris House (originally it had been Sunnyside – far too twee), and registered the name with the appropriate Government department. There an unknown bureaucrat inserted an extra "r" and then claimed it was far too difficult to reverse the registration to the original. Maris had been a local magistrate, sitting on the Linton bench around 1900 and had owned the house in which I lived. My first Malaise trap sold at £28, which I now know was too cheap. John Noyes gave me a useful order – the very first for Marris House Nets – and so the Museum technicians lost the job.

Since then, in 26 years, the price including VAT, has risen to £96 and I estimate I have sold at least 6500 Malaise Traps to at least 24 countries. In my own way I reckon I have made a considerable mark on entomological collecting and research. I also found I had no time to work on Chalcids, though I have accumulated thousands of Mymarids awaiting identification.

Unfortunately the success of the business meant I could not give a decent amount of time to my own entomology. I also wanted to get back to fleas. One of my aims has been to produce separate County Lists of Fleas for every British county. I have done six, four more are actively in the pipe-line and six more are being actively considered. I shall never complete the whole lot but, D.V., I shall get a lot done. There is a great amount of information to come out. Since Smit's extremely valuable 1957 paper on British flea distribution, hosts and literature I have gathered 1348 new County and Island records. At a guess about one third have been published and fleas have been recorded from fifty islands not in Smit's list. In all probability there are well over 2000 new 10km square records. Quite a lot of work to be done.

However the years are catching up and I need to relax from the pressure of business. So, with regret, I have decided to give up Marris House Nets and get back to the fleas. In the last 26 years, during which I don't think I've missed any of the annual AES fairs, I have made many friends and acquaintances. I know hundreds of you by sight although fairly few by name, my "forgettery" results in me retaining rather few names though scores of you know me as Bob. I have enjoyed this friendly familiarity. You have asked me to make many specially designed pieces of equipment for research work. You have produced ancient, tattered, smelly old nets, worn out after decades of use and asked for replacement copies because the frames they fit are of sizes no longer made. At a wedding I supplied two nets, one with a red knobbed handle, the other had a black knob, for the arch through which the newly-weds left the church, in a "his and hers" arrangement. A tremendous upsurge of interest in Odonata, particularly in North Ireland, brought orders for over 40 nets during the 2002 summer alone. Almost every year at least one of you, usually more, have brought me fleas – many, many thanks. On the down side there are those of you who want a new collecting bag but don't know whether it has to be 14 inches or 16 inches diameter for the frame which, of course, is at home. There is the lady who turns up almost every year and spends upwards of forty minutes moaning about recalcitrant South American Customs

Officers. There are the groups of friends, up to half a dozen, who meet for the first time for months right along the front of the stall and block access for potential customers. But I like the parents who know nothing about entomology but want to help their children to gain interest. These are many of our future entomologists. I am grateful to the many of you who were happy with what I have been able to supply. I have been happy to help you.

Then, as I left the building at the end of the 2002 Fair, I passed two men chatting and heard "It's no use sending anything to him for identification, he doesn't know the difference between a tortoiseshell and a Rottweiler."

Oh!

Please keep the fleas coming. My best wishes to you all and may the A.E.S. go on for ever.

Finally, my thanks to Dorothy who has tolerated, more or less, through nearly 60 years of marriage, the chaos in the house that my activities have caused. Soon there will be less chaos.

Beetle Swarm in Littlehampton

by Stuart Cole (10159)

21 Wensleydale Gardens, Hampton, Middlesex TW12 2LU.

During a day trip to the town of Littlehampton on the Sussex coast on 7th May 2001, I witnessed an unusual abundance of flying beetles along the seafront. The weather was sunny, but with a cool north-easterly breeze (from the land). In the early afternoon there must have been thousands of small beetles of various species in flight and landing on the ground all along the beach.

I had no containers with me, so I was unable to take any specimens for certain identification. However, I can be confident that a species of *Meligethes* (Nitidulidae) was the most abundant of these beetles, followed by a *Philonthus* sp. and a *Tachyporus* sp. (both Staphylinidae). Also very numerous were the 7-spot Ladybird (*Coccinella septempunctata*) and a weevil of the genus *Sitona*. Other species noted were a *Sphaeridium* sp. (Hydrophilidae), an *Aphodius* sp. (Scarabaeidae), an *Amara* sp. (Carabidae) and a tiny *Cypha* sp. (Staphylinidae). Amidst all these beetles were a few black flies of a species from the family Bibionidae.

The Beginner's Guide to Caddis (Order Trichoptera)

by Ian Wallace

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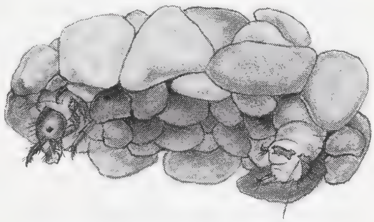
Illustrated by Phil Wilkins (7607)

Peregrine Productions, The Summerhouse, Orford Road, Tunstall, Suffolk IP12 2JA.

Adult *Rhyacophila septentrionis*



Agapetus fuscipes larva in case

Caddis larvae, living in a case they have made, are some of the most familiar freshwater insects. They are thought to derive their name from Elizabethan street hawkers called caddice men who sold braid and had samples stitched to their coats. While the common name for the group is derived from the larva, the scientific name for the order, Trichoptera, alludes to the hairy covering of the adult's wings. A few species rely on the hairs to form the wing pattern in the same way that the related Lepidoptera rely on scales. However, in the majority of caddis the brown or grey pattern of the wings is in the membrane and cannot be removed by rubbing, unlike the Lepidoptera. There are 198 British and Irish species in 18 families.

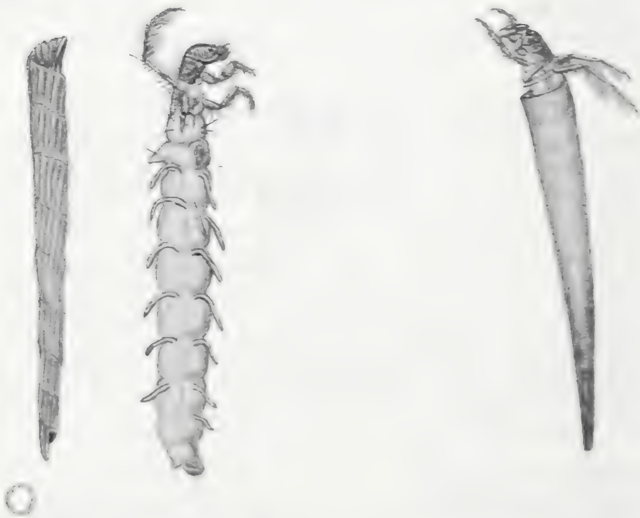
Encountering adult caddis

As expected for an insect with an aquatic larval stage, you will encounter the largest number and variety of caddis near water. Many species fly in the early night and pass the day resting on bank-side vegetation from where they can be dislodged on to a beating tray. However you will find that, by energetic leaping, they will soon escape from the tray, even if they do not fly off. Beating into a sweeping net is more successful.

Many do form day-flying swarms over the water and the most familiar are the long-horned caddis of the family Leptoceridae, whose

antennae far exceed the body length. They form zig-zagging swarms close to the water surface a few feet from the shore. They may look easy to catch but have positioned themselves a certain distance from the bank. As you carefully wade out towards them you become the bank and they obligingly move away from you. Speed, luck and wet nets and clothes are the order of the day!

Adult *Mystacides longicornis*



Triaenodes bicolor case and larva

Leptocerus cineiformis larva and case.

Adults also come to light trap, even at a distance from water. Particularly common in traps away from water are the caddis that breed in sites that dry up over summer, which season is passed as an adult. These long-lived insects diapause in various places of which bunches of green ash keys are especially favoured – a fact drawn to my attention by Dr Jim O'Connor of the National Museum of Ireland, Dublin.

Adult caddis are imitated by fly-fishermen and several have been given angler's names.

Identifying adult caddis

Adult caddis can be pinned, or preserved in isopropyl alcohol, available from chemists. However, their identification is troublesome. Despite having patterned wings, only about a third of species can be identified using wing patterns AND there are currently no books showing the patterns anyway. Examination of the genitalia is necessary to get to species level in most cases, and the only in-print guide costs about £150. Enlisting the assistance of an expert is the only practical solution for most beginners.

Encountering the larval caddis

Any water body (except those that are dry for more than six months a year, or are moderately polluted, or worse) is likely to have caddis larvae.

Caddis larvae fall into two categories. However, like the split between micro- and macro-moths, it is not entirely based on their taxonomy. The groups are the "cased" caddis, which make a transportable case, and the so-called "case-less" caddis. The latter term is very confusing as most live in a fixed shelter, with only four British species in one genus being truly free-living.

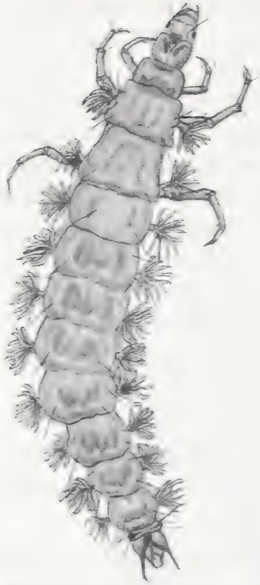
Caddis larvae should be preserved in alcohol such as isopropyl alcohol. Methylated or Surgical Spirit are possible but not ideal as they go cloudy on dilution and have other chemicals that could affect the colour patterning.

Identifying the caddis larva

Whereas there are no easy characters to identify groups of caddis adults, several groups of caddis larvae are easy to recognise. However, even then identification to the species requires a microscope and identification keys, but fortunately, the latter are comparatively inexpensive.

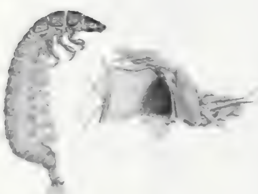
The "caseless" larvae

Rhyacophila larvae are unmistakable. These free-living predators of running water have green bodies, yellow and black heads and bunches of reddish gills along the sides of the body. There are four species.

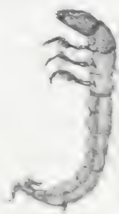


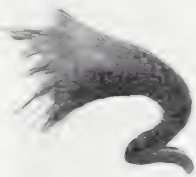
Rhyacophila dorsalis larva

Three families live in shelters based around nets. Hydropsychids, with their strong thoracic plates and bunches of white ventral gills, create a rather coarse meshed sieve to catch pieces of plant or very small animals floating in the current of streams and rivers. There are nine species. Philopotamids have white bodies and orange heads and live in a sock like net in fast flowing water. The mesh is very fine and catches single celled plants. There are five species. The last group of net makers are the Polycentropodids who live in both still and slowly flowing water. The nets of 12 of the 13 species are tangle traps, and act like underwater spider's webs to ensnare other animals; the enigmatic *Ecnomus tenellus*, our only representative of the family Ecnomidae also feeds this way. The exception in Polycentropodidae is *Neureclipsis bimaculata*, whose french horn shaped nets act as sieves for floating material. These can be conspicuous

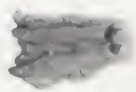


Hydropsyde sp.
larva and net





Neureclipsis bimaculata net

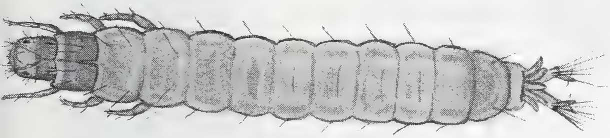
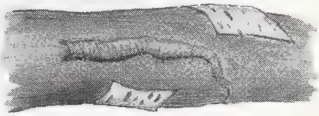


Wormalldia sp.
larva and net

Holocentropus picicornis
larva and net

The final group of shelter making caddis, the Psychomyiids, are very small and graze algae from the surface of rocks in still and flowing water. They create a tube to cover their activities and this ends up

meandering over the surface. Ten species live in this way and a further two, in the genus *Lype,* build their tubes on submerged rotting wood, on which they feed.

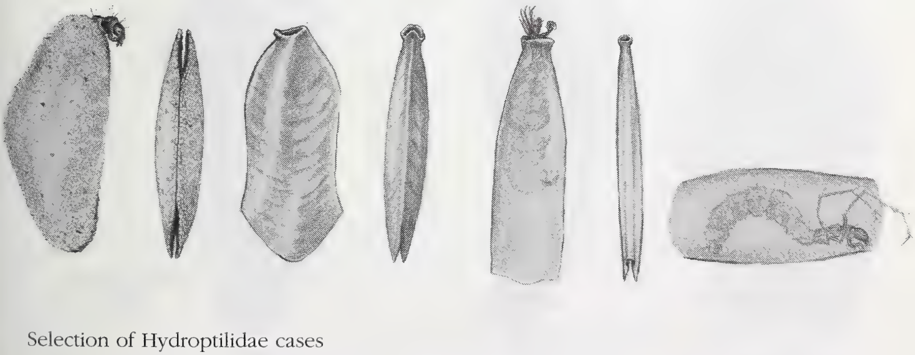



Lype sp. larva and tunnel

The "cased" larvae

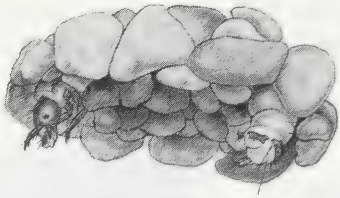
The majority of caddis have larvae that build transportable cases, and with experience, many can be identified to species level. However, for the beginner, a depressingly large number are not particularly characteristic having cases that could be best described as being made of sand grains, or haphazardly connected plant material, or a mixture of sand grains and incorporated plant fragments, depending on what is available. For that reason it is not possible to provide features to enable identification of most cased caddis larvae. However, a few are very distinctive.

The micro-caddis of the family Hydroptilidae have cases only a few millimetres long but most of the genera make distinctive cases and all are laterally flattened. Most species cannot be identified beyond genus level.



Selection of Hydroptilidae cases

L to R: *Hydrophila* sp., *Ithytrichia* sp., *Oxyethira* sp., *Tricholeicohiton fagesii*

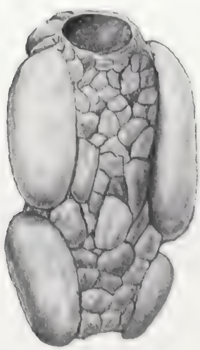

Agapitus fuscipes larva in case

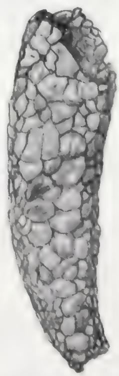
Another very distinctive group, and very common on rocks in running water, and occasional lake shores, are the six species of Glossosomatidae. They make their rounded humped cases of coarse sand grains. If the ventral side is examined it will be seen that the two case openings are identical i.e. there is no front and back, and the larva uses both alternately as front. For some unknown reason only two species are found in southern Britain. They graze algae and fine settled organic matter from the surface of rocks.

Several other caddis make humped cases i.e. if looked at from the side, the top edge overhangs the bottom edge, even after normal case curvature is taken into account. Humped cases of coarse sand grains in small spring streams are made by *Apatania muliebris* a species without males. The females lay fertile eggs without need of mating. Similar ones on stony lake shores are of *Apatania wallengreni* which does have the normal arrangement of male and female. Cases like this from a river will probably be *Ceraclea annulicornis* or, if smooth due to being made of small sand grains – *Ceraclea dissimilis*.

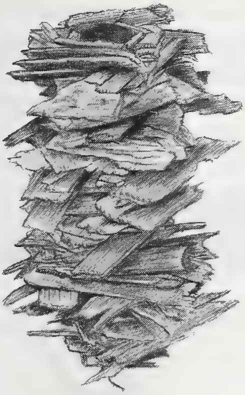
Being dislodged then washed away, is always a problem for caddis. This is tackled by the three species of Goeridae which incorporate large ballast grains into the sides of their cases.

Bare sandy bottoms may appear to be an exposed position for a caddis larva but *Molanna* has case extensions that completely obscure the head from above.


Goera sp. case


Apatania muliebris case


Molanna augustata larva and case from below and cross section

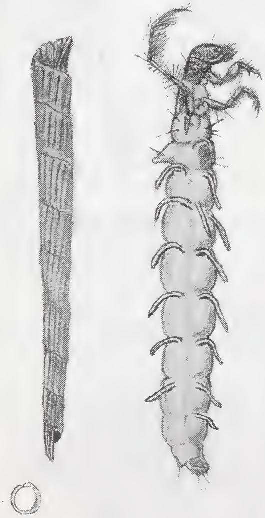


Limnephilis stigma case

Sampling a weedy pond or lake any time from autumn to late spring will collect chunky cases that have the pieces of cut plant material attached transversely, rather than lengthways. A group of five *Limnephilus* species make this "log-cabin" type of case and one of them, *L. stigma,* which uses grass blades, produces one of the bulkiest of all caddis cases in the form of a shaggy barrel shaped item.

Some of the finest craft-skilled caddis larvae use carefully cut pieces of plant material to make their cases. Joining pieces in a spiral fashion is popular. If the case is large and the larva has a propensity to leave it, the investigator will have found one of the five species of the family Phryganeidae. If the case is small and slender and the larva within rows itself and the case through the water by vigorous beating of the fringed back legs then the larva will be *Triaenodes bicolor* if from still water, or the genus *Ylodes* if from running or brackish water.

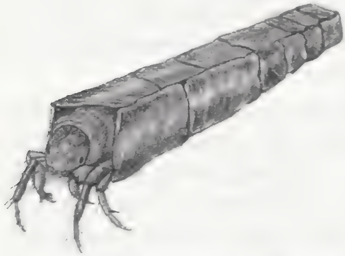
Phrygaena sp. case



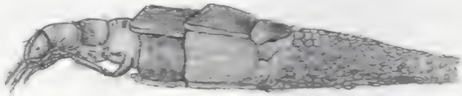
Triaenodes bicolor case and larva

In rivers, a distinctive square section case will be of *Lepidostoma hirtum.* If it is fixed firmly to a piece of vegetation with the larva sitting with outstretched legs to catch passing particles then it will be from one

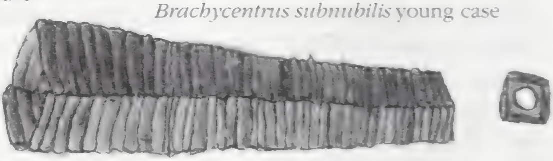
of the angler's great early spring flies the Grannom *Brachycentrus subnubilus*. Older Grannom larvae have cases that are rounded in section. *Lepidostoma* also constructs a case with the posterior end of sand gains and circular in cross-section, and that is also the situation for *Crunoecia irrorata* that inhabits tiny trickles.



Lepidostoma hirtum larva and case

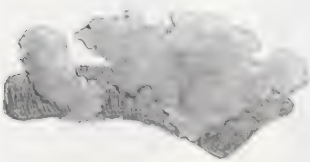


Crunoecia irrorata larva and case



Brachycentrus subnubilis young case

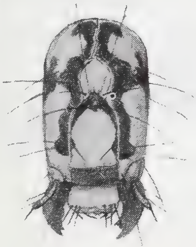
A caddis case is made of a tube of silken threads to which other items are attached, and some caddis dispense with the external material. *Leptocerus tineiformis* makes a slender case and rows through the water of ponds and lakes using its fringed legs. A group of three species in the genus *Ceraclea* that have cases made only of silk feed on freshwater sponge and often attach disguising pieces of sponge to their cases. Some caddis change to a silk case later in growth. A relative of *Leptocerus tineiformis* starts with sand grains then abruptly changes to only silk, and the Grannom starts with plant pieces and ends with mainly a case of silk.



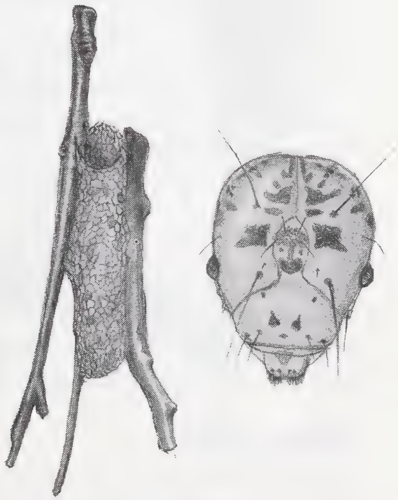
Ceraclea albimacula case, with sponge attached

Brachycentrus subnubilis older case and larva

Although cases made of a tube of sand grains to which long sticks are attached are made by several species, two deserve singling out. Both have black marked yellow heads. If the case is small and the hind legs of the larva are considerably longer than the other legs it will be of the genus *Mystacides*. If the hind and middle legs are of a similar length and the head is particularly blotchy it will be *Anabolia nervosa*. It is said that the sticks assist the larva to hold station against strong current but it will probably also make it harder for a fish to approach close enough to hoover up the larva.

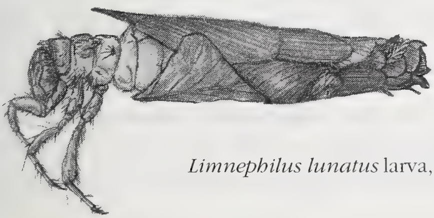


Mystocides unigra larva, case and face



Anabolia nervosa larval case and face

It is unfortunate that Britain's commonest large caddis *Limnephilus lunatus* does not have a distinctive case, or head pattern. However, a caddis from flowing water, in a straight case of plant material with or without sand grains at the front end and with a banded head, is likely to be *Limnephilus lunatus*.



Limnephilus lunatus larva, case and face

Encountering caddis pupae

Pupa of *Goera* sp.

When full grown, all free-living and shelter dwelling caddis make a case of stones or plant debris, attached to a stone or large plant, in which to pupate; cased caddis larvae also attach their cases and then seal up both ends, apart from small grilles to allow passage of oxygenating water.

To emerge, the adult, still in its pupal skin, cuts out of the case or shelter using special mandibles. It then rapidly swims to the surface of the water or the bank, using fringed legs. It is assisted in reaching the surface by a bubble of gas secreted between the adult and the skin. This however makes them appear as a silvery bubble that is very conspicuous to fish. Large numbers of caddis are predated at this time. Many species emerge at night when the fish cannot see them – but waiting Daubenton's bats can detect these juicy mouthfuls.

A successful individual splits the pupal skin, the adult rapidly emerges expanding its wings in a few seconds as it wriggles out of the skin, then flies to a nearby bush to dry its wings for a few minutes. The pupal shuck floats away, an empty husk.

Rearing caddis

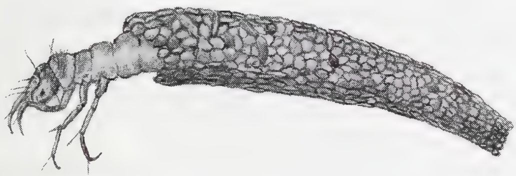
It may be difficult to identify caddis but they can be interesting to keep. Do not try to rear any of the free-living or shelter makers unless you have the ability to create a strong uni-directional current. Cased caddis can be kept with varying degrees of success. A good group to start with are those that live in ponds, such as the "log-cabin" limnephilids. They will usually eat dead leaves of trees like sycamore – but do not over feed, and a *little* aeration might be helpful.

Glyphotaelius pellucidus larva and case

Another intriguing caddis to rear is *Glyphotaelius pellucidus*. Look out for jelly eggs on leaves of trees that overhang ponds and ditches or in places where ponds and ditches will be when the water level rises. Only one other British caddis lays like this – the large and superb *Nemotaulius punctatolineatus* of

Highland blanket bogs. Keep the egg mass moist but not wet until tiny dark larvae can be seen moving within the jelly. Submerging it will let them escape. They feed on dead tree leaves and it is useful to have both sycamore (for food) and oak (for case making); the case is a flat affair. Collect leaves from the pond rather than from the ground as they will have both lost the rather toxic tannins and developed the micro-fungi and bacteria which are what the larvae are really after as food when they eat leaves.

Though it is easy to rear many cased caddis larvae, it is surprisingly difficult to get successful emergence of an adult from the pupal skin. It is best to place the sealed up cases into a shallow and not vertical edged bowl filled with water, but also lined with netting up which the caddis pupa can climb. Even then, many refuse to emerge and become eventually water-logged and die several days later. Incidentally, Britain's only terrestrial caddis, *Enoicyla pusilla* of the Wyre Forest woodlands, is also difficult to rear to the adult, usually dying during pupation.



Enorcyla pusilla larva and case

Assistance with identification

Due to the absence of cheap books, I am prepared to identify voucher examples of caddis adults but not bulk samples and only if asked in advance of sending material please. I need to schedule work carefully!

I am also able to confirm the identity of caddis larvae. Again I would want to do voucher specimens only. I would preferably want the collector to have tried to use the available keys first.

After a little familiarity many caddis adults and larvae can be identified in the field. My aim is to increase the pool of people interested in, and recording caddis, rather than just add to the sum total of records, valuable though that is.

Caddis Recording Scheme

There is a national caddis distribution recording scheme operated under the auspices of the Biological Records Centre, CEH Monks Wood,

Abbots Ripton, Huntingdon, Cambridgeshire PE28 2LS. Details of how to contribute records, the aims of the scheme and some of its current projects, can be obtained from the Biological Records Centre, or from its web-site or from me personally.

Further reading

Hickin, N.E. (1967) *Caddis Larvae* published by Hutchinson, London
(a good introduction to caddis larvae, with some lovely illustrations but out-of date for identification of larvae; the key to pupae however remains serviceable)

Macan, T.T. (1973) A key to the adults of the British Trichoptera *Scientific Publications of the Freshwater Biological Association* , Number 43.
(long out-of-print, and with a few errors, but worth obtaining if you can. A list of problems that might be encountered when using Macan is available from Ian Wallace at Liverpool Museum)

Malicky, H. (1983) *Atlas of the European Trichoptera* Junk, The Hague.
(very expensive, and as it covers all the European species it is not a book for the beginner)

Edington, J.M. & Hildrew, A.G. (1995) A revised key to the Caseless Caddis Larvae of the British Isles *Scientific Publication of the Freshwater Biological Association*, Number 53
(the definitive key to identify caseless caddis larvae)

Wallace, I.D., Wallace, B. & Philipson, G.N. (2003) A revised key to the Cased Caddis Larvae of the British Isles *Scientific Publication of the Freshwater Biological Association*, in press.
(the definitive key to identify cased caddis larvae)

Wallace, I.D. (1991) A review of the Trichoptera of Great Britain *Research and survey in nature conservation* No. 32, published by the Nature Conservancy Council, Northminster House, Peterborough, UK
(a distribution summary for every British species; a few are out of date but an update is available from Ian Wallace at Liverpool Museum.)

Flight behaviour of the Cyprus Grayling, *Hipparchia cypriensis* in the Troodos Mountains

by Rob Parker (5247)
66, Cornfield Rd, Bury St Edmunds, Suffolk IP33 3BN

Eddie John (7937)
Davies Cottage, Penllyn, Cowbridge, Vale of Glamorgan CF71 7RQ

The Grayling is a butterfly which occurs in various species and subspecies across Europe, existing in Cyprus as the endemic *Hipparchia cypriensis.* In Britain, *H. semele* is recognised as a species with very precise temperature requirements, and its manner of inclining its wings to absorb the sun's rays, or to avoid them is well known. In Cyprus, its behaviour in flight first caught my attention in 1974, when I observed it moving "in streams", following a set route, usually downhill along some sort of line feature, flying in a determined, almost migratory manner. Seeing the same behaviour again in 1998 prompted me to discuss it with colleagues, and to investigate the phenomenon in more detail. Working together with Eddie John (EJ), and entomologists resident in Cyprus, enough information was gathered to allow an understanding of how Graylings respond to heat in the Mediterranean climate.

Early Observations

In May 1975, in the pine trees above Troodos village, I made my first observations of the Cyprus Grayling. Sitting in a deck chair facing downhill, I noticed that they were passing my ear from above, and flying down the slope without stopping. Moving in ones and twos, they seemed to keep coming, and I wondered why they were on the move. Time went by, and none of them came back. I stirred and caught a number, ascertaining that both males and females were involved. On subsequent visits, I saw the same behaviour, sometimes with more butterflies, apparently a continuous stream, flying in single file, with just five or ten metres between them. In a typical sighting, they followed the course of a dried river bed, a line of trees, or the edge of a sun/shade demarcation. Often all of these conditions were met in one place, and a return visit at the same time the next day found a similar movement in progress. The direction seemed generally to be downhill, rather than north, south, east or west.

My interest was recharged when I saw the movement near Pedhoulas on 15 July 98. They were flying at the edge of the shadow, but just in the sun, and about a metre above the rough ground, flying downhill and

into wind, moving into an irrigated valley below. Two days previously, I had seen a congregation of about 40 feeding on moist ground about a mile below, and I suspected that the water was the attraction. I counted 80 in the 15 minutes between 1540 and 1555 hours, with just eight flying uphill in the same time frame. By 1600, the numbers were much reduced, and I took the opportunity to climb uphill to discover where they were coming from. They were emerging from the shadow at the head of the gully, and I entered the forest, only to discover that they could not easily be tracked in the shade. I climbed only about 300metres, before recrossing the road which had made a hairpin bend. The other side of the road was also wooded, but there was no sign of Graylings crossing at that point. Perhaps this was the end of the movement for the day; possibly there was some sort of daily cycle.

An analysis, by EJ, of published and unpublished observations by colleagues, both in Cyprus, and of other *Hipparchia* species in other Mediterranean localities, showed that much larger migrations had been noticed on occasion, usually in the autumn. We began to improve our understanding of what questions to ask, and what to look for at the next opportunity.

Autumn Dispersal

It fell to EJ to make the more detailed observation that led to understanding the autumn dispersal. He was in the Troodos mountains on 27 Sep 2000, when the first rain of autumn arrived, with thunderstorms, hail and abrupt temperature reduction. Weather station data shows that the temperature at 1400m, (at Prodromos) which had been in the mid to high 20's, fell to a daytime maximum of 14.6 deg C. This appears to have been the trigger that started the autumn dispersal. Over the next two weeks, he and colleagues witnessed large scale downhill dispersal to warmer conditions near the coast. The temperature gradient amounted to a gain of 1 deg C for every 100m of vertical descent. The pattern of these dispersals was outward from the higher elevations of Troodos (Mt Olympus, 1951m), down to where the grass was about to start growing as a result of the rains. The females seek out suitable grassland breeding areas, and eggs are laid. An annual cycle of movement can now be perceived.

Life-cycle

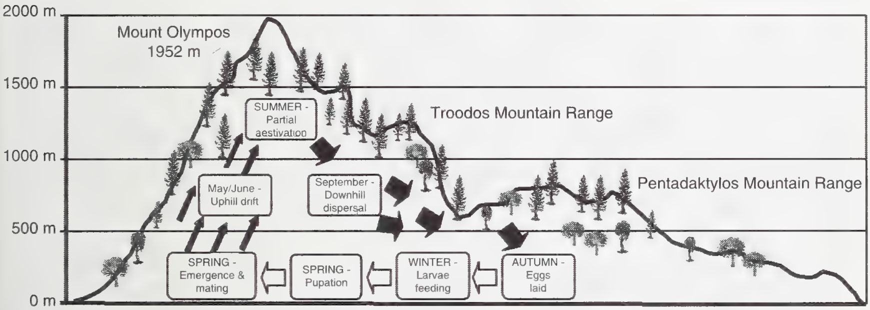
Eggs are laid on *Poa* grasses that have been parched out over the long hot summer, (Cyprus has eight species of Poaceae) and the larvae hatch to find plenty of food from the fresh growth. They feed up from

November, developing slowly but continuously in the mild Cyprus winter. At sea level, there is no need for the larvae to hibernate, as is normal in Britain, though this strategy would have been necessary high in the Troodos mountains, where snow lies for some weeks. The low nutritional value of the foodplant requires protracted feeding to achieve pupation by the time the grass is desiccating in Mar/Apr. The new generation of adult butterflies emerge from early April and into May.

Mating is thought to occur promptly after emergence, a belief supported by the presence of a sphragis in the genitalia of females caught later in the season. Rising temperatures, lack of rainfall and lack of foodplant oblige the adults to survive the summer by moving uphill.

The Cyprus Grayling (*Hipparchia cypriensis*)

Life-cycle and seasonal dispersal.



Patterns of Dispersal during the annual cycle of *H. cypriensis*:

Uphill drift and Downhill Dispersal occur on all faces of the Troodos massif but may be restricted to the highest elevations of the Pentadaktylos range.

Uphill Drift

The Spring movement begins in late May, and has been observed into early June, with Graylings dispersing uphill to a cooler domain. This dispersal is much less easily detected than the downhill dispersal, because the adults are spread over a wide area, and only gently concentrate as they reach the pine forests above 1000m. They seek out the shade, generally roosting on the main trunks of mature pines, where they feed from exuding sap.

Summer

The hot summer months are spent in a condition of rest, rather than inert aestivation. Steep sided gullies and the underside of concrete tunnels or bridges are sometimes selected as roosting sites for a small

congregation of Graylings, but not in sufficiently large numbers as to be described as "communal roosting". The presence of water or residual moisture also seems to play a part in the choice of site. Individual butterflies are easily disturbed and will fly from time to time, usually moving only to an adjacent tree. Their camouflage is exceptionally good, but if one can be spotted, it can be taken between two fingers, and lifted from the trunk in its sleep. Needs, such as moisture and temperature control, appear to prompt them into flight at times, leading to the local movements, or "flying in streams" mentioned earlier. They are sensitive to photoperiod as well as temperature, and as autumn approaches, will be ready for the final temperature drop that will trigger the mass dispersal downhill.

Topography

The island of Cyprus, with its central Troodos massif, makes an ideal situation for observing this movement, though similar patterns of behaviour are to be found elsewhere around the Mediterranean. Our observations suggest that the movement is bounded by the lowest grasslands, and the highest pine forests. The range of movement is probably much less for the majority of the individual insects, with the shortest distance between cool forest and suitable grassland being only a few miles in some seasons. The pines on the northern mountain range, and the even lower Akamas hills cause local modifications to the movement patterns described. Beyond the island situation of Cyprus, the physical boundaries of Grayling movement will be dictated by topography, and sometimes restricted to a slice of mountainside. More complex topography, however, can complicate the matter of deciding whether a migratory movement is downhill, northwards, out to sea, or towards suitable feeding/breeding habitat.

Further Reading

Anyone with a deeper interest, or the opportunity to observe Grayling flight behaviour, is urged to read the more comprehensive account in John & Parker, 2002, which also gives a more detailed account of work published on species other than *Hipparchia cypriensis*. To avoid confusion, it is worth adding that other Grayling species do fly in Cyprus; for a clear account, see John, 2000.

Bibliography

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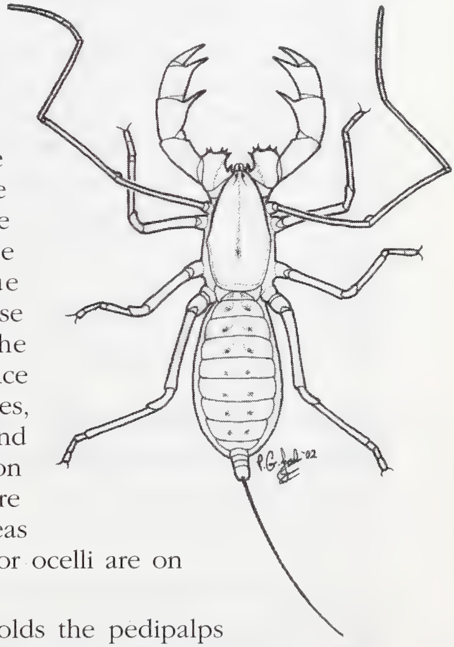
John, E. & Parker, R. 2002. *Dispersal of Hipparchia cypriensis (Holik, 1949) (Lepidoptera Nymphalidae, Satyridae) in Cyprus, with notes on its Ecology and life-history*. Ent. Gaz.53:3-18.

Whip Scorpions

by Peter Jack

33 Chiltern Crescent, Wallingford, Oxon OX10 0PG.

Uropygids or whip scorpions are a relatively unknown but very interesting group of arachnids. They are among the most unusual and sinister looking of arthropods and yet they are completely harmless to handle – I like to watch mine stroll casually along my hands and arms. My specimen of *Mastigoproctus giganteus*, commonly known as the vinegarone, coming from the states of Florida to Arizona, is quite impressive with a body length of 7 cms, and makes an excellent and undemanding pet.



People could be forgiven for thinking that vinegarones are insects rather than arachnids as they only have three pairs of walking legs, the front pair of legs being modified into long antenna-like structures which are constantly used to explore the surface over which they are walking, rather like a blind man using a white stick. The pincer-like pedipalps which true scorpions sometimes use for this purpose are more claw-like in the case of the whip scorpions and have the appearance of a pair of powerful toothed mandibles, adding much to the creature's size and insect-like appearance. Also in common with insects, the largest pair of eyes are located at the front of the body, whereas in the true scorpions the largest eyes or ocelli are on top of the cephalothorax.

When threatened the vinegarone holds the pedipalps open, waves the front legs around and flicks the whip like flagellum projecting from the abdomen from side to side, presumably to give the impression of a particularly powerful sting. At the same time a puff of formic acid may be released – this may act as an irritant to any aggressor. Anecdotal evidence abounds as to the toxic nature of this gas but I have not found it to have any adverse effect on me, and it is very rarely used.

It is difficult to find much information on how to keep these creatures. After a little experimentation I have found my pet seems to like a peaty substrate into which it can burrow, and some pieces of cardboard to provide cover. I am sure that alien species such as this may not always be immune to the micro-organisms common in this country i.e. mites ticks and bacteria, so I regularly sterilise everything that goes into the tank by using a microwave oven. I provide water by means of a plastic container from which a wick protrudes, although I think the whip scorpion probably obtains all its moisture requirements from its food, which consists mainly of crickets and waxworms. Although it feeds regularly and survives quite well at room temperature, it seems to be at its best when kept at a temperature of about 23°C, by means of a heat mat placed under half of the tank to provide a temperature gradient.

Whip scorpions are expensive and can be rather difficult to obtain – Virginia Cheeseman of 3 Sutton Road, London TW5 OPG, tel 020 8572 0414 has them occasionally. They do however make ideal pets, combining the qualities of being easy to look after and handle with an extremely bizarre appearance, and I would thoroughly recommend them to anyone wanting something "a bit different".

Twenty-six Butterfly Species in Southern France, 15th September 2002

by Matthew Rowlings (9108)

29 Woodpath, Southsea, Portsmouth, Hampshire, PO5 3DX

I had visited this spot before at 1250m below Col de Tende, Alpes Maritimes. It is a gorgeous location amongst the mountains. The site follows a track, which cuts along a hot south-facing bank. On 16th August 2001 I only managed 25 species. In 2002 I managed 26, a full month later. The mid-August Brown Hairstreak (*Thecla betulae*) was perfect, the single Baton Blue (*Pseudophilotes baton*) interesting, neither species being seen on my mid-September visit. In August I counted an estimated 75 Autumn Ringlets (*Erebia neoridas*), a species new to me here in 2001. By contrast I rattled up approximately 300 individuals of this species on 15th September 2002. Mid September yielded many

more females than the two or three I spotted in August 2001. Males however vastly dominated on both visits, but much less so in September. Females showed a tendency to feed at the Knapweed species that were dotted about the side of the track while the males were more interested in basking on the hot rocks. I presume the females were behaving responsibly and feeding up to the benefit of their developing eggs.

The numerous fresh Chalk Hill Blues (*Lysandra coridon*) found in September were intriguing as I was on a prowl for the Provence Chalk Hill Blue (*Lysandra hispana*), which is said to fly in September, but not quite this high. Could there have been Provence Chalk Hill Blues amongst them? I don't know and I failed completely to convince myself of the difference between these species at any of the sites I visited in September, including those at much lower altitudes. Damon Blues (*Agrodiaetus damon*) were another surprise, five very fresh but rather small males were taking salts alongside the Chalk Hill Blues. Six Turquoise Blue (*Plebicula dorylas*) males were extremely fresh, possibly indicating a late brood. Another surprise was a large, perfect female Idas Blue (*Plebejus idas*) – what she was hoping to achieve by emerging in September is anyone's guess. Other interesting species found during both visits included Large Wall (*Lasiommata maera*), Great Banded Grayling (*Kanetisa circe*), Dryad (*Minois dryas*), Violet Fritillary (*Clossiana dia*), possible Foulquier's Grizzled Skipper (*Pyrgus foulquieri*) (I think I'm being rather hopeful here), Southern Small White (*Artogeia ergane*) and Dusky Meadow Brown (*Hyponephele lycaon*).

Damselfly forensics

Peter Holland (6700)

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Insects of the order Odonata (dragonflies and damselflies) exhibit some of the most remarkable reproductive behaviours described in any animal. For example, more than twenty years ago Waage (1979) showed that male damselflies not only deposit their own sperm during mating, but they also remove "rival" sperm deposited by other males that mated previously. In theory, this should ensure that the last male to mate is the genetic father of the majority of the subsequent offspring. Waage's study focussed on *Calopteryx maculata* (an American

damselfly closely related to our own banded demoiselle *C. splendens*) and although the details differ greatly between species, similar behaviour has since been described for many damselflies and dragonflies. "Sperm removal" is clearly in the male damselfly's best genetic interests, but the same is not necessarily true for the female. For example, if the female allowed multiple males to father her offspring, this might result in more genetic diversity amongst her nymphs and possibly increase the percentage surviving.

An important question, therefore, is how efficient is sperm removal? Is the last damselfly male to mate successful in fathering the majority of offspring? This is a rather tricky question to address. One way to get a direct answer is to take each individual egg laid by a female damselfly (or the subsequent nymph) and then determine who their fathers are. In other words, we need to conduct a damselfly paternity test! A few years ago, I set out to do exactly that, together with two colleagues: Gillian Cooper and the late Peter Miller (author of a well known field guide, Miller 1987). Although the details of our study have been published elsewhere (Cooper et al., 1996a,b), readers may be interested in a summary of our damselfly rearing methods and the paternity results.

We employed a DNA-based test used in human forensics, immigration cases and paternity disputes, known as "microsatellite typing". Microsatellites are short but extremely variable regions of DNA that differ in length between individuals. Since they are inherited following standard Mendelian laws, every individual inherits one copy of each microsatellite from his or her mother, and a different copy from his or her father. By comparing microsatellite "fingerprints", it is possible to determine whether two individuals really are parent and offspring, or whether several offspring share the same father. The extreme sensitivity of DNA testing is well known and has revolutionised crime scene forensics, often allowing positive identification (or exclusion) of suspects from trace samples. In our study, the same sensitivity enabled paternity to be deduced even for newly hatched first instar damselfly nymphs.

To obtain unmated females, we collected late instar damselfly nymphs from gravel pits in Oxfordshire (April to June 1991). These were reared in a $45 \times 35 \times 35$ cm glass aquarium, two thirds full of tap water (previously left to stand for several hours) with constant aeration. Nymphs were fed with live *Tubifex* worms and *Daphnia*, vegetation was provided and twigs were placed strategically to assist emerging damselflies. To ensure that the newly emerged damselflies did not escape, the aquarium was contained within a Perspex box (50 cm^3). We

decided to concentrate our study on the Blue-tailed damselfly *Ischnura elegans*, and indeed the majority of damselflies emerging were this species. Other damselflies (mostly *Enallagma cyathigerum*) were released back into the wild on emergence. The female *I. elegans* were placed in cube-shaped mating cages (20-30 cm^3) constructed from simple wooden frames covered in nylon or cotton mesh (weave size 1-3 mm), with an overlapping mesh 'door' secured using Velcro. Cages were covered with aluminium foil on the vertical sides, to minimise disturbance. Twigs were placed in the cages to provide perching sites, and the damselflies fed with live fruitflies (*Drosophila*). To increase humidity and provide drinking water, bowls of water were provided, but covered with perforated aluminium foil to prevent drowning. No other special environmental conditions were used, apart from some additional daytime heating provided by an angle poise lamp. Individual male damselflies could then be introduced in a controlled manner, until mating occurred.

In order to examine paternity, we needed to encourage the mated females to lay eggs in captivity. This proved surprisingly easy, using the following method. We placed strips of coarse paper in Petri dishes containing water to a depth of 5 mm. The female damselflies laid large clusters of eggs in the filter paper, presumably mistaking it for fibrous vegetation. We used Whatman 3MM chromatography paper, but any very coarse fibrous paper would probably work. Filter papers were removed daily, rinsed and placed in fresh water. Nymphs emerged after 12 to 15 days. Only after females had laid their first batch of eggs did we introduce a second male for mating. Second and subsequent batches of eggs were then used for paternity testing.

Using the DNA test described above, we found that the second male to mate is usually the father of around 80% of the nymphs. This implies that the male damselflies are indeed quite successful at removing much of the sperm deposited in a previous mating. They are rarely 100% successful, however, so perhaps the female has some control over fertilisation. Surprisingly, we also found that the second male's "success" tended to decrease as the female laid any subsequent batches of eggs, further emphasising that removal of rival sperm is far from absolute.

These findings prompted us to tackle a second question: how many times do *Ischnura elegans* mate in the wild? Since we knew that sperm from earlier matings is not completely removed, we could gain insight into this question by paternity analysis of eggs laid by wild-caught female *Ischnura elegans*. If they mate just once, all the nymphs should

have the same father, if twice we should see half-siblings, etc. In fact, of nine wild-caught females we analysed, we found two had mated at least twice, four had mated at least three times, and one had mated at least six times. These figures are far higher than we expected. They suggest that, in the wild, female damselflies probably seek multiple mates and control the degree of sperm removal. In this way, female damselflies may ensure that a batch of eggs has several different fathers. Whether this really does increase the percentage of her offspring surviving in the wild remains to be determined.

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Autumn Ringlet and Scotch Argus in France

by Matthew Rowlings (9108)

29 Woodpath, Southsea, Portsmouth, Hampshire, PO5 3DX.

I spent a total of seven days around the Alpes Maritimes in late summer autumn in 2001 and 2002. During these visits, I became aware of the separation of the Autumn Ringlet (*Erebia neoridas*) and the Scotch Argus (*Erebia aethiops*). At no site did I find these species cohabiting, despite both being common where encountered. Given similar habitat and altitude requirements, the species appeared surprisingly exclusive. Oddly they are two species that bear a close resemblance to each other (at least superficially), which leads me to speculate that perhaps they are more than just aesthetically related (but note the indentation of the triangular orange-red band of the Autumn Ringlet). Do they mutually exclude each other or is there a subtle habitat preference that escapes me? I concede the wing shape and brightness of the Autumn Ringlet make these species easy to separate in the field, even when in flight, so perhaps I am reading too much into this separation. I wonder if anyone encountered a site harbouring both species.

Book Reviews

A new county survey of the wasps, ants and bees of Yorkshire

Michael E. Archer

The last account of the wasps, ants and bees of Yorkshire was published during the 1930s. Hence, there is a need for a fresh look at this group of insects, particularly with the increased importance now given to their conservation. For example, about 30% of bumble bee species have become extinct during the last 30 years. This is a very high extinction rate when it is compared with the extinction rate of about 9% for the solitary species during the last 150 years. The loss of bumble bee species is probably due to the rapid rise of intensive agriculture, with the loss of flowers needed as a food source and rough grassy areas needed as nesting sites.

In this book, the introductory chapters (covering 71 pages) are rather longer than is normal for a county report. This gives the author more space to explore the history and current practice of the study of the aculeates. The first three pages give a concise outline of the book and should help the reader in its use.

Firstly the characteristics and higher classification of the aculeates are considered. There then follows a detailed account of the many different types of life-histories shown by the aculeates. Next there is a review of county recording of aculeates from 1870 until the present, so as to analyse their different formats of presentation and the characteristics that make them particularly useful and interesting to read. In recent times several new features have been introduced to county reports including the use of grid references, species maps, quality coding of species to find those most in need of conservation and the greater importance given to the habitats in which high quality species are to be found. The English Nature concept of Natural Areas also is becoming important. An attempt is made to incorporate these new features into the book. A history of recording aculeates in Yorkshire is then considered starting with F. Smith from 1852. This chapter also begins to describe the activities of a county recorder.

A review is next given of the different writing-up formats of the aculeate species from a particular site. These formats are divided into the classical, ecological, ethological and analytical. The author has particularly pioneered the use of the analytical format. A detailed account is given on how to carry out a site survey and use the collected data in the analytical mode. In particular, the following big three questions are considered and, to some extent, answered:

- How many species has the recorder failed to find on a site?
- Is the species assemblage from the studied site sufficiently complete so that it may be compared with the species assemblage from other sites?
- What is the conservation value of a site?

The Yorkshire Database is then considered in terms of its records, species and habitats and sites. For the Records section the following information is provided with the help of tables and a map: the record fields used; sources of records; collectors, determiners and confirmers of the records; and the taxonomic, temporal and spatial distribution of records. For the Species section the following information is provided with the help of tables, maps and histograms: the county lists of Smith, Roebuck, Butterfield & Fordham, and the author; year of discovery and extinction of species; species quality coding in national and regional systems; spatial distribution; adult seasonal activity; cleptoparasitic load; aerial nester frequency; and a comparison of species richness between counties.

The Habitat and Sites section starts with a detailed consideration of the resource requirements of the aculeates, a modified broad habitat classification and the Natural Areas of Yorkshire (with map). The relationship of aculeate requirements and broad habitats is given. Then about 200 sites are considered in terms of their habitats characteristics Natural Area by Natural Area. This section can be considered as an introduction to the better known sites to be found throughout Yorkshire.

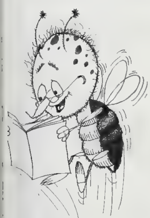
The species account part of the book deals with 324 species in 98 pages. An introductory account is given for each taxonomic unit as appropriate, be it family, subfamily, genus or species-group. For each species, besides the map, the following information is usually given: national and regional status; period of adult activity; first and last year when recorded; total and 1970 onwards number of records, sites, 1 km and 10km squares.

The Appendices, covering 30 pages, are a major part of the book. Appendix 1 is an extensive list of references; Appendix 2 acknowledgments; Appendix 3 a list of species whose records have been rejected with reasons for the rejections; Appendix 4 lists the 200 or so sites dealt with earlier in the book, giving the grid reference and Natural Area for each site; Appendix 5 lists Smith's manuscript species of bees thought to occur in Yorkshire; and Appendix 6 gives more information about a further 14 species that have become rare species in Yorkshire since the publication of the author's Red Data Book on threatened and rare aculeate species in Yorkshire during 1998.

In summary I have used the benefits of using electronic recording to fully analyse the Yorkshire records, examined the world of the aculeates in terms of their habitats and sites and drawn attention to the conservation needs of this taxonomic group.

Michael E. Archer (2000). *The Wasps, Ants and Bees of Watsonian Yorkshire*. Yorkshire Naturalists' Union. 200 pages with 328 maps, 16 tables, 58 B & W and two coloured illustrations. £6.50 (£5.00+ £1.50 P & P). Orders to Dr. M.E. Archer, 17 Elmfield Terrace, Malton Road, York, Y03 11 EH.

My book: *Threatened Wasps, Ants and Bees in Watsonian Yorkshire. A Red Data Book*, can be obtained as a package for the two books for £8 (including P & P).



The Distribution Atlas of European Butterflies

by Otakar Kudrna. 342 pp. ISBN No. 87-88757-56-0. Oedippus Nr. 20 , 2002. Naturschutzbund Deutschland and the Gesellschaft fŸr Schmetterlingsschutz. Available from Apollo books at apollobooks@vip.cybercity.dk (Price 50 Euros).

Dr Otakar Kudrna's impressive atlas gives the results of the 6-years Mapping European Butterflies project. Black & white dot distribution maps for 451 butterfly species show three different time periods. Two species maps (DMAPs) fill each A4 page - a major improvement on the thumbnail maps of most field guides. Each recording field is one degree of longditude by half a degree of latitude, (on average 58km on the ground). The database is a mosaic of National records (from countries which have recording schemes) and the contributions of individuals who specialise in particular countries or taxa.

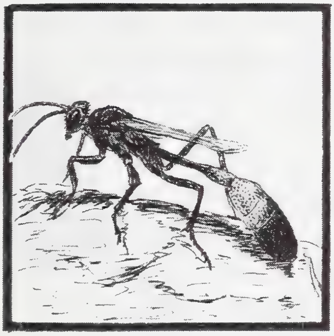
Europe covers 45 countries, states, or parts thereof, from Ireland to the Urals. All the Mediterranean islands are mapped, whilst the records for the Azores, the Canaries and Madeira are tabulated. Only the European parts of Turkey and Russia are included, with coverage relatively thin in the east.

Scientific nomenclature is used in the interest of precision, and the absence of English common names may discourage some amateur readers. The species checklist used incorporates a revision of the list in Karsholt and Razowski (1996), paying attention to the latest ICZN opinions. The result is a streamlined list which loses a number of commonly used subgenera. This can result in a short search to find a species that has been absorbed into a major genus (e.g. *Artogeia* into *Pieris*). This hurdle could easily have been overcome by the inclusion of an index.

The analysis that follows the species maps includes some outstanding (and controversial) material concerning distribution, diversity and conservation. The areas with the highest diversity are shown, and the species which occur in the highest lowest number of squares are tabulated. It is interesting to note that most of the British species are found close to the top of the list of Europe's most widely distributed (i.e. commonest) butterflies. Endemic species found in very few squares can thus be treated as Europe's rarest, and may merit conservation priority even if they are not currently under threat. The interplay between that approach and recent RDB work is thought provoking, and could lead towards a pan-European approach to conservation.

Dr Kudrna's forthright style pervades the text; he has had the courage to take rigorous decisions on everything from taxonomy (his specialisation), survey methods, map presentation, computer systems and international co-operation. As a result, we have an authoritative atlas to carry us into the future.

Rob Parker (5247)



ANNOUNCEMENTS, REQUESTS AND REPLIES

Regular readers of the Bulletin will not recognise this section. The aim is to try to increase the interactivity between members. This section can remain as long as there is interest and material to include.

Please send replies or further requests or announcements to the AES PO Box, or email to aes@theaes.org.

Anyone who finds this section useful is recommended to join the AES Forum, a discussion group on the internet. This can be found at http://groups.yahoo.com/group/aes.

REGISTRAR DETAILS

The people who purchased my previous house have been inundated with post and phone calls for me from AES members. Would members please remove my old details from their records and make certain they have my current ones, as follows:-

Nick Holford, AES Registrar

8 Ruddle Way, LANGHAM, Rutland, LE15 7NZ

Tel: 01572 723532

E-mail: nick@fivecon.force9.co.uk

NOTICE OF SPECIAL GENERAL MEETING

Notice is hereby given that under clause 6(iii) of The Constitution and Rules of the Society a Special General Meeting will be held at London Zoo on Saturday 26th April 2003 at 10.50 a.m.

Following advice received from The Charity Commission it shall be proposed at the meeting that clause 7(ii) be amended so as to read :-

"The Council shall comply with their obligations under The Charities Act 1993 (or any statutory re-enactment or modification of that Act) with regard to the preparation of an annual return and its transmission to the Charity Commission. In addition, a copy of the accounts and balance sheet shall be sent to each member in or with the *Bulletin* each year."

THE DIRECTORY FOR ENTOMOLOGISTS

This AES Publication is currently being revised by Fiona Merrion-Vass. Any contributions of relevant organisations, companies, museums, recording schemes, etc should be sent to Fiona as soon as possible via the PO Box or e-mail: aes@theaes.org

Epiphyas postvittana (the Aussie invader) – a reply

by Ray Softly (5734)

12 Parliament Court, Parliament Hill, London, NW3 2TS

I am happy to respond to Phil Robinson's request for information about *E. postvittana* (Robinson, 2002). I run, continuously, two actinic traps at ground (G) and second floor balcony (B) level at the above address. This is a block of flats facing (at the back) south east across a railway and adjacent to Hampstead Heath station. The statistics below (table 1) show no particular bias between the two trap levels (which many other species do). There is a virtual annual doubling of the numbers trapped, with a suggestion, this year, that a peak may be approaching. The pin-pointing of other continuously run traps across the country should provide a record of the front or fronts along which the species has advanced.

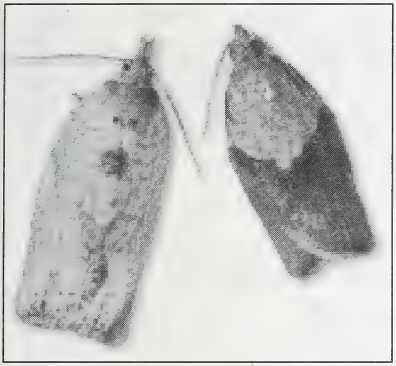


Figure 1. *Ephiphyas postvittana*: Female (left and male (right).
Photo courtesy of Greg Baker and Peter Bailey, South Australian Research and Development Institute.

Table 1. Numbers of *Epiphyas postvittana* trapped each year in Hampstead, Middlesex

Year	Total	Ground level	Balcony level
1995	1	1	-
1996	2	2	-
1997	7	4	3
1998	5	3	2
1999	35	18	17
2000	74	46	28
2001	134	78	56
2002	196	96	100

Rather than continuous brooding, my figures (table 2) suggest two very lengthy overlapping broods, divided by the first half of July. This is similar to the Garden Carpet, *Xanthorhoe fluctuata*, whose broods are divided (particularly this year) by the first half of August.

Table 2. Numbers of *Epiphyas postvittana* trapped each month of 2002 in Hampstead, Middlesex.

Month	March	April	May	June	July	August	September	October	November (to Nov 6)
Numbers	7	13	24	29	20	72	23	4	3

Saturday 26th April, 2003

The Bartlett Room, London Zoo, Regent's Park, London.

The Bartlett Room is sited in the Meetings Rooms complex that is over the road from the main entrance to the Zoo and about 100 yards to the East.

PROGRAMME

10.00 am Doors open for members to sign in. Tea and coffee will be available. Coats may be left in an unsupervised cloakroom at your own risk – the AES will not accept liability in case of a problem occurring.

11.00 am Welcoming address, followed by a lecture.

12.00 noon The Annual General Meeting will take place. Nominations for election to the Society's Council or as a Serving Officer of the Society should be forwarded to the Secretary along with the names of two nominators who should be members of the Society.

The AGM will be followed by lunch.
There will be further lectures in the afternoon.

The Zoo opens at 10.00am. Those attending the AGM and Members' Day may also have free entry to the Zoo (access from the Meeting Rooms is via a subway).

There is a Licensed Restaurant in the Zoo where lunch may be purchased, there is also a Fish and Chip stall near the "Web of Life" Exhibition. Packed lunches may be eaten in the Foyer or outside, they should not be eaten in the lecture halls.

BUG CLUB MEMBERS

Bug Club Members must be accompanied by a parent (who is admitted free) and should bring their 2003 BC membership card.

Those who are registered Family Members may all attend if they wish.

Bug Club members – There will be tours behind the scenes of the "Web of Life Exhibition". These will be happening throughout the day in small groups of members. Groups will have a time for entry, and at least two adults are to accompany each group. If you wish to take part, please say so when you sign in. Other activities will also be available.

The Bulletin
of the Amateur Entomologists' Society

Volume 62 • Number 446 February 2003

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The Bulletin

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The Amateur Entomologists' Society

Founded in 1935

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Photo: Nick Holford.

The cover of the *Bulletin* features a female worker of *Dolichovespula norwegica* (F.).

This species of wasp is very widely distributed throughout much of Britain, though it is most abundant in south-west and northern England and in Scotland. It is scarce in southern and cental England. Typically, it nests in trees, and also under the eaves of houses. A fully developed colony will have about 300-500 workers.

The Bulletin
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Searching for the Mole Cricket – an elusive subterranean monster

by Bryan J Pinchen. Co-ordinator, Mole Cricket Working Group

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At over 40 mm long and weighing almost five grammes, the Mole Cricket, *Gryllotalpa gryllotalpa*, is one of Britain's largest and most spectacular insects (Plate 1).

Even to a non-naturalist, it is an unmistakable brown monster, with large modified front legs, and a covering of fine velvety hair. The modified forelegs, similar to those of a mole (Plate 2) are used for digging the underground burrows and chambers where they spend the best part of their lives. Despite appearing lumbering and ungainly, they can run quickly on the surface, burrow out of sight with amazing speed, and even swim strongly.

To a Mole Cricket, paradise appears to be a short grass sward on a sandy loam or peaty soil, with a fluctuating water table or seepage line, and areas of disturbed or cultivated ground. This may not sound like a rare habitat in Britain, so in theory finding the Mole Cricket should pose no real problems. So why has it become one of our rarest and least often recorded insects?

Many such areas have been drained, built on, converted to intensive arable or forestry, sprayed with insecticide, and damaged beyond suitability. Some apparently suitable areas do remain, scattered widely across the UK, but more frequently in the south, where many old Mole Cricket records originate, many gardens and allotments even meet these habitat criteria.

In view of its rarity, the Mole Cricket has been given full legal protection and listed on Schedule 5 of the Wildlife and Countryside Act (1981), making it amongst other things, an offence to take specimens from the wild without a licence. In 1994 it was included on the English Nature Species Recovery Programme and the search for remaining colonies began. The aims of the English Nature funded project being to study the life-cycle of this little known insect, safeguard all remaining colonies, and through a captive rearing programme, return the Mole

Cricket to many of its former haunts. With only two confirmed records between 1970 and 1994, and no known colonies in Britain since 1970 it was never going to be an easy task.

Males sing from a special chamber constructed within the underground burrow system, exit holes for the song are made at the ground surface. The song is a soft purring-trill produced by rubbing the forewings together at high speed while the male gently sways from side to side, the song chamber acts as a resonator and amplifies the sound. Song is produced on balmy evenings in spring and early summer, and consists of either short bursts of ten or fifteen minutes, or much longer bursts lasting well over an hour or more, and is very similar to that of the Nightjar *Caprimulgus europaeus*. The distinctive song even gave rise to a number of local names, such as jarr-bob, jarr-worm and eve-churr at a time when the Mole Cricket was obviously well known and locally common. However, males may mate only once or twice during a life time, and sometimes not at all!. Females, on hearing the song either travel through the burrows to the male, or travel over ground, they may even fly towards the source of the song.

Mating probably occurs within the song chamber, and sometime afterwards, the female constructs a tennis-ball sized underground egg chamber. Here, 30-50 eggs are laid and these are tended and cleaned by the female, to prevent mould growth, until they hatch some two to three weeks later. The newly hatched nymphs are also cared for by the female for a short period after hatching. Not all nymphs develop at the same rate, but in general, those hatching during the spring of 2002 will moult to adult in early 2004, some may take longer and moult in the spring or even autumn of 2005. Mole Crickets are one of our longest lived orthopterans; with individuals often surviving into their fourth year.

Adults and nymphs are omnivorous, eating a range of soil invertebrates, including leatherjackets and wireworms, as well as vegetable matter, including root vegetables and the roots of herbaceous plants. Burrows can sometimes be traced through vegetable and flower gardens by following the irregular track of withered plants, whose roots were in the path of a feeding Mole Cricket. Nymphs and adults can burrow to depths of 30 cm or more, if soil conditions permit. Adults have fully developed wings, the forewings are short covering only half of the abdomen, while the hindwings are long, rolled to prevent damage while burrowing, and extend slightly beyond the tip of the abdomen. Adults are strong but unwilling fliers and seem to lack any great steering ability, often being attracted to bright lights leading to collisions with illuminated windows, with a fairly loud thud!

To assist our survey, visits have been made to Guernsey and the Netherlands where the species can still be found, and a number of useful survey techniques learnt. It was noticed in Guernsey that Mole Crickets and their burrows could be found beneath debris (old paving slabs, pieces of board and even polythene mulch) lying on the soil surface in a number of gardens (Plate 3). Burrows could be found in lawns and flowerbeds, and a quick dig beneath these often resulted in a Mole Cricket (or three!) in a single spit of soil. Such debris refuges have been placed in areas in southern England with the most recent records, but so far none have yielded any evidence of Mole Crickets.

In captivity females will respond to song tapes of the male, and this too has been tried in the field in areas where Mole Crickets are known to have occurred, again with no success, other than provoking the local Nightjars into song. However, all of these survey techniques rely on a population of Mole Crickets being present, blind survey of suitable looking habitat has so far always proved negative.

So how do we find any remaining colonies of the Mole Cricket in Britain? Appeals have been made through the entomological press, national and local newspapers, TV and radio, with three confirmed and a number of unconfirmed records coming from over 400 responses.

The three most recent confirmed records; from Macclesfield in 1996, Luton in 1999 and Chelmsford in 2000, have come as a result of such appeals, but despite extensive follow-up survey at each site, no further evidence of these elusive creatures has ever been found. So, eight years after the project began we have a list of sites where the Mole Cricket has probably occurred during the last 20 years, from Devonshire and Glamorganshire in the west, Lincolnshire and Kent in the east and Sutherland in the north. But apart from single specimens from Macclesfield, Luton and Chelmsford, we still have no hard evidence to suggest the Mole Cricket is still present in Britain, and so the search continues...

Have you seen one in the UK?, I would be very pleased to know of any sightings which may lead to the discovery of a Mole Cricket colony. If you do come across one, a photograph as proof of the sighting, and details of the circumstances of the find are required for confirmation.

Rugged Oil Beetle *Meloe rugosus* (Marsham 1802) (Coleoptera: Meloidae) new to Dorset

by John Walters

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On 23 February 2003 I spent a couple of hours looking for beetles on the sandstone cliffs east of West Bay, near Bridport, Dorset. After a couple of hours searching during the afternoon in overcast, mild conditions I reached the end of the cliff face at Burton Freshwater. It was getting late and I had to get back so I had a final search along a steep sandy bank near a caravan site (SY475897). Whilst searching through some low vegetation there I found a very small (12mm long) oil beetle (*Meloe*). Thinking it was just a small specimen of the Black Oil Beetle (*Meloe proscarabaeus*) I put it in a bug pot so I could photograph it later in better light.

After examining the beetle more closely, it became obvious that it was not *M. proscarabeus* as it had a very narrow pronotum (thorax) and very coarsely punctured head, pronotum and elytra (wing-cases). (Plate 5).

After consulting Joy (1932) and Ramsay (2002) I identified it as the Rugged Oil Beetle (*Meloe rugosus*). This is a very rare species in the United Kingdom, classified as Red Data Book 3 – Rare. It is currently known from a handful of sites in Gloucestershire and Worcestershire, though there are old records from South Devon, East Kent, South Essex, Berkshire, Oxfordshire, Derbyshire and North Somerset (Hyman and Parsons, 1982). It was previously unknown from Dorset.

It is an unusual species as it is active during the late autumn and winter. Adults can be found from late September to February, being most frequently seen in October (Whitehead, 1990). They inhabit sheltered south-facing slopes where solitary bees of the family *Andrena* are found.

Of the nine species of oil beetle recorded in the UK, only three have been seen in recent years. These are the Rugged Oil Beetle; the Black Oil Beetle, *Meloe proscarabaeus*, which can be locally common around the coasts of south-west England and Wales; and the Violet Oil Beetle, *Meloe violaceus*, which is widespread in western Britain, usually in upland areas.

As with other oil beetles, the Black and Violet Oil Beetles have a strange life history. The adults can be found on sunny days from late February to June, often walking beside paths. They feed on leaves and flowers, the Violet Oil Beetle is particularly fond of celandine flowers.

The female beetle digs small pits in the soil in which she lays a large batch of eggs. These hatch into the first larval stage, the *triungulin,* which climb on vegetation and can be found in large numbers on flowers. Here they wait until bees visit the flowers then hitch a ride with the bee back to its nest. The vast majority must perish at this stage. To survive they must get into the nest of a solitary bee of the family *Andrena* (although other hosts, e.g. *Anthophora* spp. are known). Once in the nest the larva consumes the bee's eggs and then feeds on the pollen stored for the bee larva. It pupates in the nest and emerges the following spring.

Acknowledgements

Thanks to Dave Boyce and Darren Mann for confirming my identification. The specimen (a female) has been sent to Darren Mann to be incorporated into the Hope Entomological Collections at Oxford.

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The sport of the chase – Obscure and curious items of entomological literature, Part 1

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Over several years, Brian Gardiner, a previous editor of this journal, published a series of articles on some lesser-known entomological books in his library. He did this in a spirit of clearing up some bibliographical inconsistencies, giving interesting background to several important and historical works. In a similar vein I offer some details of a few obscure and curious books that have found their way into my own library. However, in a departure from Brian Gardiner's theme, the books I offer are not useful key works by important entomologists, they are strange oddities, quaint and off-beat. But they are all peculiarly entertaining and I treasure them all.

Butterfly and moth collecting by C. S. Coleman

This 2500-word article, contributed by the author of the many editions of *British butterflies* (1860 onwards), appears in a massive four-volume series of books entitled *The encyclopaedia of sport* (published in London by William Heinemann, 1911). To justify its inclusion, Coleman begins:

"That butterfly and moth hunting is a sport, no one will deny who has ever chased a strong flying fritillary over rough country, or tried to snare over the treacle a restive rarity that refuses to become intoxicated. We therefore give a few practical hints for its successful pursuit."

The book covers all manner of sport from aeronautics (with bulbous Zeppelins, spindly-looking biplanes and various kite-like affairs) to yachting and goes into great detail over the various intricate rules of croquet, lawn and real tennis, soccer, rugby football, boxing and the like. It is copiously illustrated with photographs and line drawings, of famous sportsmen and women, important sporting venues and all manner of equipment, techniques and pitch layouts.

This much might be expected in a sporting encyclopedia, but it is Coleman's introductory paragraph that gives a clue to the book's most thorough coverage – field sports. These do not just include fox-hunting and hare-coursing, but virtually every animal on the planet that can be trapped, chased or shot at, from alligator to zebra. I would not have examined the four volumes lying in a broken cardboard box at Greenwich Market a few years ago, but for the fact that, although

volume 1 was mundanely labelled "A to cricket", volume 2 offered the unlikely contents of "crocodile to hound-breeding".

The volumes make fascinating reading, offering tips on what bore to use and where to aim when shooting a hippopotamus or a moose; how to make a catapult out of a Y-shaped privet branch, 1/16th inch rubber elastic and a dog-skin pouch; how to get life-like effects with your home taxidermy, and an annotated list of sea-fishing resorts round the English coast from Tweed to Solway.

Sitting amongst this endless text of huntin', shootin' and fishin' tales, Coleman's rather blithe text sits somewhat askance. Nevertheless, he does justice to his allocated topic and takes the reader through the necessities of capture and apparatus, famous localities, sugaring, breeding, setting, storing and exhibiting. He gives a practical list of reference books, including his own modest butterfly contribution. As with other entries in the encyclopedia, it is the precise historical and social detail, fixed for the first decade of the 20th century, which lifts the text out of the ordinary.

He suggests that a broken golf-club makes the best stick for beating trees and bushes. After his and other treacling recipes he recounts how "one keen collector assured me that an absolutely infallible method was to take in the mouth a spoonful of the mixture and to spray it on to leaves, &c., mingled with saliva!" One hopes this was not the golden syrup and methylated spirits mixture quoted as being "easier to procure in country places".

When looking for moths at light, he gives a tantalising picture when describing how in towns "a poaching flavour is sometimes given to the expedition by the protests of policemen, and of the gas company's employees, a less propitiated race". He goes on to admit that the gas mantles are liable to suffer damage. He finishes by warning against saving a few shillings on poor quality cabinets. "The usual price for the best quality is 15s. each drawer, measuring 16 ½ by 19 ½ inches, and they can be obtained from any entomological firm."

Apart from a short introduction to mayflies, alderflies and stoneflies in the fly dressing section of the rainbow trout article in volume 3, Coleman's is the only entomological entry in the encyclopedia. Nevertheless I snapped it up for a bargain £10 and still leaf through its heavy volumes occasionally, enthralled by the quaint accounts of hunting in a colonial time now long passed.

The changing fortunes of British Odonata

by Dr Peter G. Sutton (7388)

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Introduction

I was once asked by a colleague: "Why, when we have comparatively few species of dragonfly in this country, did I have so many books on British dragonflies? Surely they must all say the same thing?!"

"Perhaps," I replied, and promptly launched into a monologue about said books that left him holding a cold cup of tea and viewing the world through glazed eyes. The point I was trying to make was that these books are nothing short of a tribute to this remarkable and successful group of insects, who epitomise the beauty of the natural world, and who have inhabited this planet for many millions of years, such has been the success of their genetic blueprint. That they have inhabited the Earth for so long is an incredible feat in itself, and to have reached such an evolutionary pinnacle at such an early date has meant that dragonflies have transcended time virtually unchanged, from sharing the company of the long since departed *Eryops* in a prehistoric swamp, to dodging traffic on a busy road in the vicinity of a disused London brick-pit.

Those of us who have enjoyed the vivid splendour of an Emperor Dragonfly patrolling the reeded margins of a millpond on a summers day, or been dazzled by the sheer beauty of a Brilliant Emerald at a Sussex woodland lake, or marvelled at how something as seemingly delicate as a Scarce Blue-tailed Damselfly can yet master the air in a manner befitting such an accomplished predator; may begin to understand what inspires a naturalist to tell others of these observations. And how. For a brief glimpse through each book quickly reveals that they are informative works of art, being a credit to the authors, artists and photographers who have toiled hard to produce them. Each book can be judged favourably on its own merits, and in addition to providing data regarding the increasing knowledge gained through continued interest and study of British dragonflies and damselflies, they are a celebration of the talent of wildlife artists and photographers who have contributed to those works. The recent appearance of several high-quality publications (Follett, 1996; Merritt, Moore and Eversham, 1996; Powell, 1999; Brooks and Lewington, 2002) has ensured that this fine tradition has been continued.

The first "informative work of art" was undoubtedly that produced by W.J. Lucas in 1900, which is simply entitled: *British Dragonflies*. At a time

when entomological artists were prone to produce work which was characterized by anatomical incorrectness, this book was illustrated with superb drawings and diagrams of all British species known at the time, which were, and still are, "field accurate". In addition to the wealth of information provided (which gave entomologists a "baseline" distribution for the 39 species described), this book is embellished further by the style in which it is written, going so far as to include, as Lucas puts it, "Tennyson's exquisite lines in the *Two Voices*":

"Today I saw the Dragonfly
Come from the wells where he did lie.

"An inner impulse rent the veil
Of his old husk; from head to tail
Came out clear plates of sapphire mail.

"He dried his wings: like gauze they grew;
Thro' crofts and pastures wet with dew
A living flash of light he flew."

Much has changed since Lucas wrote the first "standard" of Odonatan literature. Three species have disappeared from the British List (although two had yet to be discovered at the time of Lucas' publication); some have disappeared from whole regions as a result of land drainage and agricultural intensification; some formerly scarce species have expanded their ranges; and in recent years, changes have occurred at such an extraordinary rate that it has been difficult to predict what will happen next!

This article provides a brief overview of some of the changes that have occurred since the time of Lucas, and focuses on the latest developments that are currently taking place with regard to the expanding British List.

Extinctions

Local, regional and national extinctions of British Odonata have been caused by the deterioration and loss of wetland habitats, primarily as a result of land drainage and agricultural intensification (including loss of habitat through afforestation) and reduction of water quality through pollution events. A summary of the current threats to dragonflies, which also addresses "pollution and eutrophication", "alteration of site hydrology" and "inappropriate habitat management", is provided by Murray (2002).

Three species were lost from the British Isles during the 20th century.

The **Orange-spotted Emerald**, *Oxygastra curtisii*, which was first recorded at Parley Heath in Hampshire, was subsequently described by its discoverer, J.C. Dale (1834) as a species new to science. A Natural History Museum specimen shows that the last British record was that of a male captured by B.P. Moore at Hurn in Dorset (formerly Hampshire, and still part of the well-known site for this species on the Moors River) on 19th July 1963 (Merritt *et al.*, 1996). This species was almost certainly lost from its last known site as a result of a sewage discharge into the Moors River (Moore, 1991; Brooks and Lewington, 1997). The Orange Spotted Emerald is restricted to Western Europe. It is recognised as being "Endangered" and is afforded protection under the EU Habitats and Species Directive*.

The **Dainty Damselfly**, *Coenagrion scitulum*, was first discovered in Britain on 21st July 1946 by E.B. Pinniger (Pinniger, 1947) near Benfleet in Essex. It was recorded from this area until 1952, but was not recorded again after this area became inundated with seawater during the floods of 1953. It is possible that this species became established in Britain as a result of the significant migratory events that took place during the 1940s (Parr, 2000).

The **Norfolk Damselfly**, *Coenagrion armatum*, was recorded in Britain between 1902 and 1957. This species was seen regularly at Stalham on the Norfolk Broads until the 1950s and it appears that Cynthia Longfield's fears (1954), that this species would become extinct if the observed drying out of its habitat was allowed to continue unchecked, were realised.

Lost and found

The **Scarce Emerald Damselfly**, *Lestes dryas*, was feared to have become extinct in Britain in the 1970s (Merritt *et al.* 1996) but was rediscovered in Essex in 1983 (Benton and Payne, 1983). These populations had probably been overlooked and this species has since been found at other sites in Kent, Essex and Norfolk (Merritt *et al.*, *loc. cit.*). The Scarce Emerald Damselfly is described as RDB2 (Vulnerable), and is a rare but often locally numerous breeding species. It is potentially threatened in Britain by seawater inundation caused by rising sea levels and sea flood events (Murray, 2002).

Range contractions

Dragonflies have suffered at the hands of man's activity in the countryside, and the destruction of wetland habitats by a variety of means has been at the heart of the disappearance of species from so

* although certain governing bodies, *e.g.* Scottish Parliament (*viz.* continued destruction of internationally threatened habitat and associated rare species), appear to be happy to over-ride such

many areas. Habitat specialists are particularly at risk, and it is clear that the **Scarce Chaser**, *Libellula fulva*, and the **Club-tailed Dragonfly**, *Gomphus vulgatissimus*, have disappeared from former haunts as river habitats have been unfavourably modified. (The Club-tailed Dragonfly, and to a small extent, the Scarce Chaser, now appear to be increasing their ranges in Britain.)

The **White-legged Damselfly**, *Platycnemis pennipes*, is vulnerable to pollution and this factor, together with clearance of bankside vegetation on rivers, has probably been the cause of the observed decline in eastern parts of its range in Britain. This species has the capacity to quickly recover from such episodes when favourable conditions return, and it is possible that with climate warming, this species will increase its range on suitable river habitat, and successfully colonise more still-water sites (relatively few are used in Britain at present) as it does on the Continent.

The loss of peatland habitats has had a severe impact on some species, particularly those that require bog pools for breeding such as the **White-faced Darter**, *Leucorrhinia dubia*; **Small Red Damselfly**, *Ceriagrion tenellum*; **Northern Emerald**, *Somatochlora arctica*; and the **Azure Hawker**, *Aeshna caerulea*. These species, together with northern species such as the **Northern Damselfly**, *Coenagrion hastulatum*, may also be at risk from climate change, which was strongly implicated in the loss of the White-faced Darter from its most southerly British sites (Murray, *loc. cit.*) The threat from global warming comes on two fronts: physical loss, or change of specific wetland habitat characteristics *e.g.* through drought; and for those truly northern species which are unable to successfully complete their lifecycle when conditions are too warm (*e.g.* Northern Emerald, Northern Damselfly), excessive climatic amelioration (Brooks and Lewington, 2002)

The **Southern Damselfly**, *Coenagrion mercuriale*, has disappeared from many sites as a result of inappropriate heathland management (Merritt, 1983; Jenkins, 1991), and that other inhabitant of heathlands, the **Keeled Skimmer**, *Orthetrum coerulescens*, has been lost from a number of sites through habitat loss and lowering of the water table (Merritt *et al., loc. cit.*).

The **Downy Emerald**, *Cordulia aenea*, has been lost from woodland pond habitats as a result of habitat destruction and inappropriate habitat management, and Murray (*loc. cit.*) describes this species, and that other inhabitant of woodland ponds, the **Brilliant Emerald**, *Somatochlora metallica*, as being vulnerable to dredging (which removes larval habitat) and the removal of bank-side trees.

The **Norfolk Hawker**, *Aeshna isosceles*, suffered a serious population decline during the last century as a result of habitat loss. Heath (1999) has documented both the dramatic decline and recent recovery of this rare breeding species, which, according to IUCN criteria, is Critically Endangered in Britain (Moore, 2000). Heath states that the Norfolk Hawker "is once again a thriving Broadland species.... and probably has a wider distribution now than at any time over the last couple of hundred years", but points out that this species is still precariously placed, with the gravest threat being unsympathetic management regimes, neglect of dykes, and conversion of grazing marsh to arable land. Cham (1999) states that "no species is under greater threat...." and that since virtually all sites are within 1 m of sea level, saltwater inundation of habitat would have potentially disastrous consequences for this species, and the plant with which it is so strongly associated (for oviposition), the Water Soldier *Stratiotes aloides*.

The **Hairy Dragonfly**, *Brachytron pratense*, disappeared from many areas after the last war as agricultural pressures increased and habitat loss, inappropriate land management, and eutrophication and pollution of waterways all took their toll on this nationally scarce species. (This species is currently expanding its range in Britain.)

The **Variable damselfly**, *Coenagrion pulchellum*, a local breeding species which can only be found in numbers on fens and grazing marshes, has also declined as a result of conversion of grazing marshes to arable land and drainage operations.

Range expansions

Range expansions can occur as a result of habitat restoration (including improvements in water quality), but it is clear that some species are responding positively to climatic amelioration.

After declines experienced during the last century, which have been attributable to pollution events and unsympathetic river habitat management, two of our rarer species are showing evidence of range expansion. The **Scarce Chaser** has been recorded from new sites in Kent and Surrey (Cham, 2000a; Brooks and Lewington, 2002). The **Club-tailed Dragonfly** was recently recorded breeding in Warwickshire for the first time in June 1997 (Reeve and Reeve, 1999), and Cham (2000) also reports expansion along the River Avon and River Teme in Worcestershire. This latter species is known to be expanding its range northwestwards in Europe (Burton, 2001).

Similarly, the **Hairy Dragonfly** is also expanding its range and breeding in many new areas, particularly in the Midlands (Parr, 2000).

Dey (2000) reports that this species is fairly common and spreading in Sussex.

The **Migrant Hawker**, *Aeshna mixta*, which was formerly a rare species confined to south-east England (Lucas, *loc. cit.*) became firmly established as a breeding species during the 20th century, and continues to move northwards at virtually the same rate as the **Emperor Dragonfly**, *Anax imperator*, which is also undergoing a north and westward range expansion. Clark and Waller (2002), discuss this matter, and provide a distribution map showing the apparently synchronous northward expansion of both species into Durham and adjacent counties between 1990-2001.

The **Broad-bodied Chaser**, *Libellula depressa*, has recently appeared in northern districts, and Hunter (2000) describes a sighting of this species in Durham as "the fourth Broad-bodied Chaser to be found in north-east England."

The continuing range expansion in Britain by the **Black-tailed Skimmer**, *Orthetrum cancellatum*, to some extent mirrors the fortunes of the Migrant Hawker. Even at the time of Chelmick's Provisional Atlas (1979), this species had a distinctly south-eastern distribution (as did the corresponding map for the Migrant Hawker), but this species has marched steadily north and west (as detailed by Merritt *et al.*; *loc. cit.*) in recent years. In 1900, Lucas stated that this species "has a liking for brick holes and gravel pits", which was somewhat prophetic since the extraction industry has greatly facilitated its range expansion.

Another outstanding northwards and westwards range expansion has been observed for the **Ruddy Darter**, *Sympetrum sanguineum*. Clarke and Waller (*loc. cit.*) state that this species almost certainly colonised Cumbria in 1995, and it has now been recorded in the Scottish Borders on the Solway coast (Brooks and Lewington, 2002**).

Heath (*loc. cit.*) states that the modern population increase observed for the **Norfolk Hawker** is attributable to habitat restoration techniques, which have recreated ideal conditions for this species, to the extent that in some areas, it has become locally abundant again, spreading and recolonising former haunts. The "inconsistencies" that Heath describes with regard to the apparent success of this species at sites which may be regarded as unsuitable, and indeed, sites which do not contain Water Soldier, a plant formerly recognised as being almost exclusively used by this species for oviposition in British populations, may reflect current changes in the ecological requirements of this species, that have occurred as a result of climate change. This species uses a variety of

** It is a measure of the current pace of change that a copy of this revised edition is required to confirm that this species is now resident in Scotland.

plants for oviposition on the Continent, and the "relaxation" of formerly stringent habitat requirements, which is becoming a familiar feature of species at the northern limit of their range which are currently undergoing range expansions, may account for this apparent diversification.

Cham (2000) reports that the Norfolk Hawker has been recorded in a number of new areas in Norfolk and Suffolk, and is expanding westwards along the River Waveney.

There is recent evidence to suggest that the **Southern Hawker**, *Aeshna cyanea*; **Red-eyed Damselfly**, *Erythromma najas*; the **Brown Hawker**, *Aeshna grandis*; and the **Scarce Blue-tailed Damselfly**, *Ischnura pumilio*, are currently expanding their ranges (Brooks and Lewington, 2002). This latter species, which was thought to be extinct at the end of the last century (Corbet *et al.*, 1960), is known to extend its range northwards and eastwards in favourable seasons (*ibid.*). (Cham (1996) concludes that the recent easterly expansion is almost certainly due to the creation of man-made habitats.)

Burton (*loc. cit.*) also considers that the **Black Sympetrum**, *Sympetrum danae*, should be added to this list.

Recent additions to the British List

In 1999, Parr (1999a) described the possibility of the **Small Red-eyed Damselfly**, *Erythromma viridulum*, already being present but overlooked in Britain. This species was promptly discovered at three sites in Essex that same year (Dewick and Gerussi, 2000), and is now an established breeding resident which occurs in Kent, Essex, Buckinghamshire, Bedfordshire, Suffolk, Norfolk and the Isle of Wight (Cham, 2002).

This species provides a striking example of the rapidity with which a species can expand its range when favourable conditions prevail. Changes in the distribution of many European Odonata are occurring at such a rate that this colonisation remained unforeseen virtually until it occurred. It is a measure of this rate of change that this species was not included by Merritt *et al.* (*loc. cit.*) in 1996, in the section describing "possible additions to the British and Irish dragonfly fauna".

The **Southern Migrant Hawker**, *Aeshna affinis*, is regarded as a vagrant species and was first recorded in Britain when a specimen was captured on Romney Marsh in Kent in 1952 (Merritt *et al.*, *loc. cit.*). Holmes (1993) reported a probable sighting in Avon, and in 1998, the first record for the Channel Islands was received when a male was photographed at St. Martin in Jersey on 17th July 1998 (Long, 2000).

The **Lesser Emperor Dragonfly**, *Anax parthenope*, which was first recorded in Britain in 1996 (Phillips, 1997) has become an increasingly frequent visitor and is now regarded as an annual migrant. Parr (2002) states that since its initial discovery in 1996, at least 45 individuals have now been recorded, including records for southern Ireland and remarkably, Orkney (Brooks and Lewington, 2002).

The story of the first British **Green Darner**, *Anax junius*, records provides the sort of extraordinary tale that makes one wonder if Adrian Parr hasn't got a crystal ball tucked away in his wardrobe. In 1998, whilst alerting *Atropos* readers to a list of potential Nearctic immigrants that might arrive in Western Europe from America and Canada, Parr (1998) discussed the possibility of the Green Darner arriving on our shores. Soon afterwards in that same year, the first British records were received for the Green Darner (Pellow, 1999), which had apparently been brought across the Atlantic on winds produced by Hurricane Earl (Davey, 1999). Three males and three females were reported from Cornwall and the Isles of Scilly (Brooks and Lewington, 2002), and a total of seven records were received from this influx (Parr, 2000).

The **Vagrant Emperor**, *Hemianax ephippiger*, has become an almost annual migrant in recent years (Brooks and Lewington, 2002), and has, arguably, the most consistently remarkable powers of migration of any dragonfly recorded in Europe. It is still the only dragonfly recorded from Iceland (Parr, 2000). Most immigrants are believed to be of African origin, although Parr (1996) states that its presence in the Middle East and isolated colonies in southern Europe may also provide a source. D'Aguilar *et al.* (1986), who state that: "Adults have a very powerful flight, and cover many thousands of kilometres during migration", provide a map showing the extensive migrations that can occur from Africa and the Middle East into Europe (including Iceland).

This species, which has been reported from Portland in Dorset (Cade, 1997) to the Solway Firth in Scotland (Parr, 1997) could appear anywhere in Britain and Ireland at any time of year, and probably accounts for a number of unidentified dragonflies seen in Winter (Parr, 1998a). Silsby (1993) provided a review of this species in 1993, and Parr (2000) stated that there were 18 confirmed records by 2000.

The **Scarlet Dragonfly**, *Crocothemis erythraea*, (Plate 7) first appeared on the British mainland in Cornwall on 7th August 1995 (Jones, 1996) and has since appeared on the Isle of Wight in 1997 (Butler and Butler, 1998), Cornwall again in 1998 (Parr, 1999b), Devon (Parr, 2001) and the New Forest (Cham, 2002a). It was formerly known from Jersey in the first half of the 20th century where it was thought to have bred (Le Quesne, 1946).

The **Banded darter**, *Sympetrum pedemontanum*, like the Scarlet Dragonfly, first appeared in Britain in 1995, and it is probable that both species arrived with the exceptional numbers of other migrating dragonflies (Parr, 1996) that were observed in that year. A single male specimen, photographed on the southern flanks of the Brecon Beacons, North of Ebbw Vale on 16-17 August 1995 (Parr, 1996) remains the only record to date.

British List status uncertain

A specimen of the **Blue Dasher**, *Pachydiplax longipennis*, was found dead on an oil rig in British waters in the North Sea during early September 1999 (Parr, 2000a). The available evidence suggests that this North American libellulid was a genuine vagrant, but since accidental importation cannot be discounted, no definite conclusion has been drawn from this discovery. However, since migrating species are known to be attracted to the lights of ocean-going ships (Brooks and Lewington, 1997) and the like, it may be that this specimen ended its epic journey in a similar manner.

Recent additions to the British List which are known to have bred successfully in Britain

As mentioned above, the **Small Red-eyed Damselfly** has now established itself as a breeding resident (Cham, 2002). (Cham provides a map of the known distribution of this species in Britain.)

The **Lesser Emperor Dragonfly** is also known to have bred successfully in Britain (Jones, 2000; Pellow, 2000), but has not managed to establish itself as a breeding resident.

Regular breeding migrants likely to establish permanent breeding colonies

The **Lesser Emperor Dragonfly** must also fall into this category, but two species which are known to breed with increasing regularity are likely to become permanent residents if current trends continue.

The **Red-veined Darter**, *Sympetrum fonscolombei*, is now an annual migrant that breeds regularly, sometimes in large numbers (Pellow, 1999a), and has been recorded breeding successfully from the south coast (Pellow 1999b) to the Midlands (Whitehouse, 1999) and as far north as East Yorkshire (Parr, 2000). Sternberg (1998) has documented the northward spread of this species in Europe in recent years. Notable invasions of this species have been observed in 1911, 1941, 1946, 1984,

1992, 1996 (Parr, 1997a), 1998 and 2000 (Brooks and Lewington, 2002). Parr (1997a) provides full details of the extensive influx (50+ individuals in 10-12 counties) that occurred in 1996. Brooks and Lewington (2002) report that this species has managed to maintain breeding populations at sites in Kent and Cornwall over the last three to five years.

The **Yellow-winged Darter**, *Sympetrum flaveolum*, appears to be a somewhat less frequent migrant than the Red Veined Darter (Parr, 2000; Brooks and Lewington, 2002), and although it has managed to breed successfully in Britain, this species appears, as yet, unable to establish itself as a permanent breeding resident, even after major invasions. During 1995 there was a very large invasion, and Silsby and Ward-Smith (1997) provide full details (in chronological order) of 242 records from an estimated 530 records received for this species as a result of that influx. Other large invasions have occurred in 1926, 1945 and 1955, (Brooks and Lewington, 2002). In addition, Lucas (1900) reports that: "in 1871, a considerable migration of this species took place into the London district, on which occasion, Mr. McLachlan even saw several examples in the Strand."

It is interesting to speculate as to why invasions of the Yellow-winged Darter, which in 1995 at least was known to coincide with the appearance of other migrating Darters (*e.g.* Vagrant Darter, *Sympetrum vulgatum*), do not coincide with any of the "big" invasions of the Red-veined Darter.

Migrant species which have the potential to establish temporary breeding colonies

Those species which have started to appear as "regular" migrants have the potential to breed under the right circumstances.

The **Scarlet Dragonfly** has been increasingly observed on the near Continent in recent years (Hermans and Gubbels, 1997.) Ketelaar (2000) has described the presence of a new breeding colony at Limburg in The Netherlands, and has since described the appearance of several more colonies of this species in the coastal dune region in that country (Ketelaar, 2002). It is possible that this species may appear as a breeding migrant in Britain in the near future.

The **Vagrant Darter**, *Sympetrum vulgatum*, is described as a "very rare migrant to Britain" (Brooks and Lewington, 2002) but it could be argued that its similarity to the Common Darter, *Sympetrum striolatum*, means that its occasional presence has almost certainly been overlooked in Britain. Parr (1996) states that all of the 30 or so records for this

species have all come from eastern England, and that half of these were received as a result of the well-documented 1995 Darter influx.

This species, which has been recorded several times from the Channel Islands (Le Quesne, *loc. cit.*) appears to have increased its range in The Netherlands in recent years (Geijskes and van Tol, 1983), and it is likely that this species may breed in Britain at some point in the near future.

Only a single British record exists for the **Banded Darter**, but this species, which is currently in an expansion phase in Europe, has recently been rediscovered as a breeding species in the Netherlands (Wasscher, 1994). It may therefore appear as a breeding migrant and potential new colonist in Britain.

The paucity of records for the **Southern Migrant Hawker** at present makes this species an unlikely candidate for temporary establishment in Britain. Nevertheless, the rapid changes that are currently taking place (*viz.* Small Red-eyed Damselfly), together with the fact that Ketelaar (2002) cannot rule out the possibility that this might be a new breeding species in The Netherlands, makes the appearance of this species as a breeding migrant in Britain an intriguing prospect.

The increasing frequency with which the **Vagrant Emperor** has been observed in recent years suggests that a successful breeding event could occur in Britain. However, the erratic nature of sightings (particularly outside times of optimum breeding opportunity), and the fact that the nearest breeding colonies are in Mediterranean climes, makes this an extremely unlikely event.

A significant influx of the **Green Darner** could lead to a successful breeding event, but again, this is a remote possibility.

Potential recolonisations

The Dainty Damselfly, *Coenagrion scitulum*, which is known to have migratory tendencies, is present in Belgium and northern France (Vanderhaeghe, 1999) and may have the potential to colonise Britain if current climatic trends continue.

The Norfolk Damselfly, *Coenagrion armatum*, was recently rediscovered in The Netherlands (Parr, 1999), prompting speculation as to whether this species could potentially recolonise Britain. However, since the nearest known colony is 100s of kilometres away from this site, it is probable that this species had been overlooked since it was last found in this area in 1956 and as such, (together with the exacting habitat requirements of this species if it were to reach Britain) is not a serious candidate for recolonisation at present.

Global warming and the potential arrival of new species in Britain

It is clear that global climate change is largely responsible for the dynamic changes in distribution that are currently being observed for many European species of dragonfly and damselfly. Species with predominantly southern (*e.g.* Mediterranean) distributions are expected to extend their natural range northwards with climate warming, and those species with typically northern (boreal) distributions are expected undergo range contractions, which is essentially what has been recorded. Consequently, some species will benefit from climatic amelioration, whereas others, *i.e.* the northern specialists, will be threatened by these changes.

The effects of climate change on British wildlife have been considered by Barkham (1994). Burton (2001) has specifically discussed the responses of British Odonata to climate change (2001), as has Murray (2002).

In 1998, Eversham and Cooper showed that there is a strong correlation between Odonata species-richness and mean air temperatures in the British Isles, and suggested that "the predicted increase in British summer temperatures associated with global warming would be expected to permit the establishment in Britain of additional species from mainland Europe."

The arrival of new migrants and colonists in Britain is dependent upon the continuation of current climatic trends, and it is these potential new species that are considered in the following section.

Look East: The Netherlands Factor

It is from the east that some of the most remarkable migrations of Odonata have been witnessed. It is likely that European agricultural practice has put paid to some of the mighty migrations that occurred in the past (Gakte (1889) describes the migration of *Libellula quadrimaculata* which swarmed in Heligoland "by the million"), but it is clear that the observation of Odonatan activity in northwest Europe, particularly The Netherlands, provides an excellent indication (*viz.* Small Red-eyed Damselfly, Scarlet Dragonfly, Banded Darter) of which species are likely to arrive on our shores in the near future.

Ketelaar (2000, 2001, 2002) has provided some excellent reports of current developments in The Netherlands, and has provided details of species which have recently appeared in that country, and more significantly, those that have recently appeared as breeding residents at coastal sites.

Likely candidates for addition to the British List in the near future include:

The **Southern Emerald Damselfly**, *Lestes barbarus.* This species, which is appears to have recently re-established itself on Jersey (Long and Long, 2000) is currently present in good numbers within the extensive coastal dune region of The Netherlands.

The **Common Winter Damselfly,** *Sympecma fusca.* is another species which has been recorded from the Channel Islands recently (Long and Long, 2000). This species is currently spreading in The Netherlands and has now been confirmed as a breeding resident in the coastal dune region (Ketelaar, 2002).

The **Small Emerald Damselfly,** *Lestes virens,* is currently expanding its range in Europe and has been seen in increasing numbers in coastal districts in The Netherlands, where it has established breeding colonies (Ketelaar, 2000). Ketalaar states that since this species, and the Common Winter Damselfly, have "been proven to migrate over large distances (80 km)", their appearance in Britain might soon be expected.

The **Willow Emerald Damselfly**, *Lestes viridis,* was formerly included on the British List but the single record that existed for this species is now doubted (Gladwin, 1997). This species is widespread on Jersey (Long and Long, 2000), and is probably extending its range northwards in The Netherlands (Parr, 1999a).

The four species above are described in detail, with identification notes (and photographs) by Parr (1999a).

The **Irish Damselfly**, *Coenagrion lunulatum,* is a recent arrival to The Netherlands coastal dune region. It has now spread to many sites within the dune system and has recently been confirmed as a breeding resident (Ketelaar, 2002). Remarkably, this species was discovered in Ireland in 1981, where it had presumably been overlooked until then as a rare resident species, but has not been recorded in mainland Britain.

The **Canal Damselfly**, *Cercion lindenii,* (also known as the Goblet-marked Damselfly) is currently in an expansion phase in Europe, and has increased significantly in Germany, Belgium and The Netherlands. Wasscher (2002) provides details of its northwestward spread, and states that although this species is spreading its range more slowly than the Small Red-eyed Damselfly, it has "the potential to colonise Britain if current trends are continued."

The **Southern Darter**, *Sympetrum meridionale,* is a species whose historical inclusion in the British List has been called into question (Merritt *et al.*, 1996). However, it has certainly been recorded in the

Plate 1. The Mole Cricket *Gryllotalpa gryllotalpa* (male). This magnificent insect continues to elude British Orthopterists!

Plate 2. The powerful modified forelegs of the Mole Cricket allow it to burrow efficiently through soil.

Plate 3. The area of bare soil and lawn adjacent to this pond in Guernsey provides an example of typical Mole Cricket habitat.

Plate 4. These "runs" under plastic are evidence of Mole Cricket activity, Guernsey.

Plates 1-4: Pinchen, Searching for the Mole Cricket... Photos: Bryan Pinchen

Plate 6. The Black Oil Beetle *Meloe proscarabaeus* has disappeared from many areas as its host species' have declined.

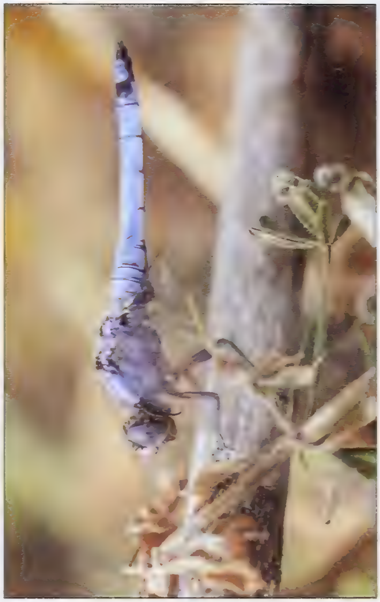

Plate 8. The Southern Skimmer *Orthetrum brunneum*, may soon appear in Britain as a new migrant species

Plate 5. The rare (RDB1) Rugged Oil Beetle *Meloe rugosus* was recorded for the first time in Dorset at Burton Freshwater on 23.ii.2003.

Plate 7. The Scarlet Darter *Crocothemis erythraea* has now been recorded on several occasions in Britain since its first appearance in 1995

Plate 5: Walters, Rugged Oil Beetle — Photo: John Walters
Plate 6: Sutton British Oil Beetles — Photo: Peter Sutton
Plates 7-8: Sutton, The Changing fortunes of British Odonata — Photos: Peter Sutton

Plate 10: *Mantophasma subsolana*, male. Collected in 1950 Tanzania.

Plate 12: Nymph of *Tyrannophasma gladiator* from the Brandberg, Namibia.

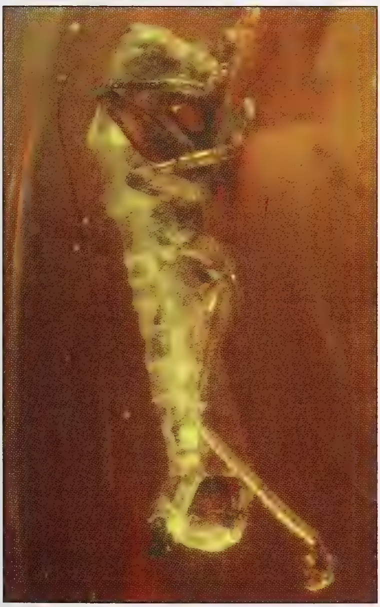

Plate 9: Nymph of *Raptophasma kerneggeri*, preserved in 45 million year old Baltic amber.

Plate 11: *Mantophasma zephyra*, female. Collected in 1909 Namibia.

Plates 9-12: Walker, Mantophasmatodea...

Photos: Thomas Kujawski ASA-Multimedia

Plate 13: Adult *T. gladiator*, Brandberg, Namibia.

Plate 14: A mating pair of the Karoo species from the arid succulent Karoo (Namaqualand), South Africa. The male is smaller and brown.

Plate 15: A green species from Cape Fynbos, about 150 km north of Cape Town. This is a female nymph (males are brown). Note the very large eyes that display a subdivision of colour

Plate 16: Another Fynbos species, collected very near the coast. They have a strong preference for the reed-like *Restionaceae* that are the counterparts of grass in this biome. Once again, a female is shown, although brown females also occur. Males are brown.

Plates 13-16: Walker, Mantophasmatodea

Photos: Plate 13: Thomas Kuzawski ASA-Multimedia
Plates 14-16: D. Mick Picker

Channel Islands (Moore, 1949), and this predominantly Mediterranean species has been recorded in The Netherlands and Belgium within the last 10 years (Parr, 2000). Available evidence suggests that this species is unlikely to establish breeding colonies in Britain in the near future.

By contrast, the **Southern Skimmer**, *Orthetrum brunneum*, (Plate 8), is an altogether more promising candidate. This species was recorded from Guernsey in 2001, and evidence suggests that it may have been present there since 1999 (Long, 2002). (Long also states that there have been two recent records from Normandy.) This species is known to be in an expansion phase in Europe (Burton, *loc. cit.*), and it re-appeared in The Netherlands in 1995 after almost a century of absence (Gubbels *et al.*, 1995). Sternberg (1998) has documented the northward spread of this species in Europe, and Parr (2002a) provides a current overview of developments, together with identification details for this species.

Other species recorded recently from The Netherlands include the **Green Club-tailed Dragonfly**, *Ophiogomphus cecilia*, which has now been confirmed as a breeding resident (Ketelaar, 2002), and the **Green-eyed Hooktail Dragonfly**, *Onychogomphus forcipatus*, which is known to be expanding its range in central Europe (Sternberg, 1998). The appearance of both species in Britain remains, as yet, a remote possibility.

Look West: The Atlantic Factor

Global warming means that the Earth will have an increasingly energetic atmosphere, which in turn means an increase in the strength and frequency of hurricanes and the strong frontal systems that are known to assist the passage of migrants from the Americas to Western Europe. This will increase the likelihood of species such as the Green Darner making landfall in the UK, and also the possibility of successful breeding if they arrive in sufficient number.

Parr (1998) describes the possible appearance of a number of Nearctic species, including the **Globe Skimmer**, *Pantala flavescens*. This species has appeared on the British List probably for as long as that List has been in existence, by virtue of the fact that a specimen was recorded from Homing in the Norfolk Broads in 1823. There have been two records since, in 1951 and 1989, both of which are believed to have been accidental imports Merritt *et al.* (1996). Silsby (1996) records a "probable" sighting of this species in Cornwall in 1995.

Other species included in the list provided by Parr are: the **Twelve-spotted Skimmer**, *Libellula pulchella*; **Blue-faced Meadowhawk**,

Sympetrum ambiguum; **Black Saddlebags**, *Tramea lacerata*; **Carolina Saddlebags**, *Tramea carolina*; **Red-mantled Saddlebags**, *Tramea onusta*; and the **Spot-winged Glider**, *Pantala hymenaea*. To this list can probably be added the **Blue Dasher**, which has been described above.

I can suggest that members listen avidly for when Michael Fish states that there *isn't* going to be a hurricane, and then hang on to their hats in the hope that the ensuing melee brings forth some New World specialities.

The Irish Scene

There are some remarkable developments taking place in Ireland at the moment. Species such as the **Emperor Dragonfly** and the **Migrant Hawker**, which were not previously recorded from Ireland, have recently established breeding colonies (Nelson; 2002, 2003). The **Southern Hawker** has been recorded as a vagrant species (Bond, 1989) but remains a potential colonist, and the **Ruddy Darter** is believed to have established itself as a breeding resident in the early part of the 20th century (Merritt *et al.*, 1996).

Ireland holds some extremely important populations of some of our very rare and localised species, including the **Scarce Emerald Damselfly, Scarce Blue-tailed Damselfly, Hairy Dragonfly, Downy Emerald, Northern Emerald,** and the **Irish Damselfly**, *Coenagrion lunulatum*.

The recent discovery of the Irish Damselfly in 1981 (Cotton, 1982), and the presence of the boreal species, the Northern Emerald, indicates that the discovery of other rare species should not be discounted. It is possible that isolated pockets of the **Northern Damselfly**, *Coenagrion hastulatum*, could be present, and the relatively recent discovery (1921*** at Hindhead and 1954 at Wisley Common in Surrey) of the now extinct southern English colonies of the **White-faced Darter**, *Leucorrhinia dubia*, means that the discovery of this species in Ireland may not be as remote a prospect as it might appear to be. Nor should the possibility of this species arriving as a successful breeding migrant be regarded as an impossibility. Ireland is known to have received some substantial influxes of immigrants, (notably in September 1947, when apparently, over a million individuals of the **Common Darter**, *Sympetrum striolatum*, (Longfield, 1948) were recorded), and the relatively recent appearance of (what were presumed to be) three White

*** Four males and two females were taken at Shining Glass Pond near Hindhead (Follett, *loc. cit.*) by Mr. Bateson. David Baldock has kindly provided a copy of an original letter between Bateson and W.J. Lucas, in which Lucas thanks Mr. Bateson for these specimens, which he exhibited on 15th October 1924 at the Entomological Society in London.

faced Darters at Walberswick NNR in Suffolk (Mendel, 1992) not only provides this story with some credence, but might also have implications regarding the origin of the Surrey colonies.

Global warming does not bode well for the continuing presence of the Northern Emerald in southern Ireland, but conversely, on the basis of current evidence, it is possible that the Southern Hawker and the **Small Red-eyed Damselfly** could both become established residents in Ireland by the end of the decade.

Suffice to say, after the discovery of the Irish Damselfly; successful colonisations during the last century and recent developments involving potential new colonists; and the possibility of finding undiscovered colonies of rare species in remote areas; the statement by Chelmick in 1979 remains as true today as it did then: "Ireland has considerable potential for Odonata recording". It is clear that Ireland still has many secrets yet to yield.

The study dragonflies and damselflies in Ireland is conducted by DragonflyIreland, which is coordinated by Robert Thompson and Brian Nelson (www.ulstermuseum.org.uk/dragonflyireland/), who produce regular reports on current developments in *British Wildlife* (Thompson, 2000; Nelson, 2002, 2003).

Monitoring new developments

For those who wish to keep up to date with new developments in this field, the following sources of information are recommended:

The British Dragonfly Society produce a journal: *Journal of the British Dragonfly Society*, and also have a website: www.dragonflysoc.org.uk

Atropos is a superbly illustrated (photographs) journal for Lepidoptera and Odonata enthusiasts and provides details of current developments in Britain and Europe: www.atroposuk.co.uk

British Wildlife is undoubtedly *the* journal for the modern British naturalist, and provides regular updates on Odonata in its "Wildlife Reports" section: www.britishwildlife.com

Book recommendations

The ***Field Guide to the Dragonflies and Damselflies of Great Britain and Ireland***, by Steve Brooks and Richard Lewington (*Revised edition*, 2002) is a highly informative text that covers all aspects of study; includes details of the current threats to and conservation requirements of each species; provides a useful regional

site guide; and is superbly illustrated throughout with the characteristically pristine artwork of Richard Lewington.

The Dragonflies of Europe, by Dick Askew (1988) is another tribute to a fantastic wildlife artist. This text provides a lavishly illustrated and comprehensive account of the European dragonfly fauna, and is an essential addition to the library of those interested in the wider European fauna.

An appreciation

It is difficult not to notice that one name linked with a number of key works in this field is that of Dr Norman W. Moore. Dr Moore's considerable effort and vision has made him "one of our most influential and successful conservation biologists over the past 50 years.....and (he) was one of the first to put insects, and a scientific approach to conservation, high on the national and international policy agenda." (Claridge and Thomas, 2002). In recognition of the advances that have been made as a result of his extraordinary foresight, it was pleasing to see that Dr Moore was honoured with the first Marsh Award for Insect Conservation by the Royal Entomological Society last year.

The AES would like to congratulate Dr Moore on this achievement, and thank him for his considerable contributions, that have benefited the fields of entomology and conservation alike.

Acknowledgements

...are due to those whose worthy endeavours have produced the colourful, informative and enjoyable texts and journals that adorn creaking bookshelves in musty, naphthalene-perfused study's across the country.

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Mantophasmatodea – A New Order of Insects

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Introduction

The number of insect species that have been described to date is thought to be only a fraction of those in existence. Estimates of the total number range from over 30 million to the recently predicted, more conservative, value of between four and six million (Novotny *et al.* 2002). Although about 10,000 new species are identified annually, the description of a new order of insects is a very rare event. The last time that a newly discovered insect was unable to be allocated to one of the existing orders was 89 years ago when the "ice-crawlers" (Notoptera, later designated Grylloblattodea) were first described in 1914.

Discovery of a New Insect Order

In May 2002 German and Danish researchers published an exciting paper describing a new insect order, Mantophasmatodea, representing the 31st order of insects (Klass *et al.* 2002). The discovery was initiated when Oliver Zompro of the Max Plank Institute, Plün, Germany found several insect specimens that could not be allocated to any known order. The first of these was contained within a 45 million year old piece of Eocene Baltic amber from the private collection of Friedrich Kernegger (Plate 9). Zompro subsequently found that an unidentified specimen, collected in Tanzania in 1950 and housed in the British Museum, resembled the fossilised insect encased in amber (Plate 10). Yet another similar preserved specimen was found at the Berlin Museum for Natural History. This had remained unidentified in ethanol-preserved material since its collection in 1909 from Namibia (Plate 11). An examination of the stomachs of these insects revealed the remains of arthropod cuticles, indicating that they were carnivorous.

The morphology and anatomy of the specimens revealed certain orthopteroid features, and the insects superficially appeared to have a mixture of both mantid and stick insect features. However, the researchers could not place these insects within any recognized order. They therefore established the Mantophasmatodea to accommodate the new discoveries – a name derived from the orders Mantodea and Phasmatodea, alluding to the superficial similarity to these insects (Klass *et al.* 2002). The preserved specimens from Namibia and Tanzania (Plates 10 and 11) represent the genus *Mantophasma* (*Mantophasma*

zephyra and *M. subsolana*; described in Klass *et al.* 2002). The fossilised specimen in amber was categorised in a separate genus *Raptophasma*, as *Raptophasma kerneggeri* (Plate 9; described in Zompro, 2001). To date a total of about 30 specimens of Mantophasmatodea in Baltic amber have been discovered.

Although the announcement of the new order was greeted with great excitement, it was not received without question. An interesting discussion ensued in the journal *Science* in which Erich Tilgner (Fernback Science Center, Georgia, USA) suggested that these insects might represent aberrant members of the order Orthoptera and therefore might not warrant the formation of a new order (Tilgner, 2002). Klaus Klass replied on behalf of the group that published the original article and appeared to counter the arguments satisfactorily, arguing that the new order did not share the unique characters of any of the existing orthopteroid orders (Klass, 2002).

The Search for Living Specimens

The next step was to determine whether members of the Mantophasmatodea might still be living today. The last known live specimen had been collected in Tanzania in 1950. Joachim Adis, Zompro's supervisor at the Max Plank Institute, distributed photographs of their specimens to museums in Africa and South America, asking whether anything similar had been found in collections. A positive response was received from Dr Eugene Marais at the Windhoek Museum in Namibia. He had found and preserved similar specimens from the Brandberg Mountains in the Erongo province of Namibia in 1990 and 2001. Recently, this spiny species has been described as belonging to the genus *Praedatophasma* as *P. marais* (Zompro *et al.* 2002).

In February 2002, an expedition to the Brandberg Massif was launched consisting of 10 entomologists from Germany, England, South Africa, Namibia and the United States. The Brandberg is Namibia's highest mountain at 2606m and is home of the famous "White Lady" bushman paintings. Here the team found a stunning species of mantophasmid at the base of clumps of grass growing beside rocks. With long antennae and impressive jaws the specimens were christened "gladiator" due to their armour-like appearance (Plates 12 and 13). Oliver Zompro collected a dozen live specimens for further study back in the laboratory. The aggressive nature of the gladiator was revealed when several were cannibalised during the return trip. It later turned out that researchers from the University of Leeds and the Windhoek Museum had previously found specimens of the gladiator on the Brandberg during visits between

1998 and 2000. The gladiator will be classified in the genus *Tyrannophasma* as *T. gladiator* in a forthcoming paper (Zompro *et al.*, 2003).

Further Species of Mantophasmid found in South Africa

The report by Klass *et al.* (2002) describing the Mantophasmatodea caught the attention of Mike Picker and colleagues at the University of Cape Town. They realised that they had previously encountered similar unusual orthopteroid insects in the semi-arid Succulent Karoo in South Africa (Picker *et al.* 2002). Subsequent searches of South African museums revealed 29 pinned specimens that had been collected between 1890 and 1994. One pair had even been preserved *in copula*. Incredibly, five specimens that had been collected in 1890 at Okiep in Namaqualand had received the attentions of Louis Albert Perinquey, an insect taxonomist at the beginning of the last century. Although he labelled them as representing a new genus and species, he probably considered them as belonging to the Mantodea, as they were housed in the unsorted Mantodea material in the Iziko Museum's entomology collection.

Picker and his colleagues have formed a South African Mantophasmatodea team, which includes Klaus Klass, as well as embryologists, molecular biologists and ecologists. To date they have discovered at least eight new species of the Mantophasmatodea in the Western and Northern Cape Provinces of South Africa (M. Picker pers. com.). The species from the Karoo region superficially resembles the gladiator specimens found in the Brandberg, although they are less spiny (Plate 14). Other species have been found in the Fynbos Biome of the Cape Floral Kingdom (Plates 15 and 16). These are more slender than the Karoo species and like all the South African species exhibit striking polymorphism in colouration within a population, ranging from brown through green and white, to green and pink. There is an excellent match between body colour and the plants on which they frequent. Brown species occur amongst more arid vegetation, while the green species all occur in the evergreen vegetation of the Fynbos Biome. These new species have yet to be named and taxonomically classified, but appear to be distantly related to the Namibian species (M. Picker pers. com.).

Classification of the Mantophasmatodea

At present Mantophasmatodea represents the smallest order of insects, with a current count of about 15 species, including those still to be described (two of these are from Baltic Amber and are presumed

extinct). Two further species have been described from Namibia, and the eight South African species are in the process of being named and classified. Therefore, at present, Mantophasmatidae is the only family in this order, containing four genera. The closest phylogenetic relationships maybe to Grylloblattodea (ice-crawlers) found in mountainous regions in North America and Asia and Phasmatodea (Klass *et al.* 2002). The detailed classification and systematics of this order are described in Klass *et al.* (2002), Zompro *et al.* (2002) and Zompro *et al.* (2003).

Order: Mantophasmatodea Zompro, Klass, Kristensen and Adis

Family: Mantophasmatidae Zompro, Klass, Kristensen and Adis

Genus: *Mantophasma* Zompro, Klass, Kristensen and Adis

Species: *M. subsolana* Zompro, Klass, Kristensen and Adis *M. zephyra* Zompro, Klass, Kristensen and Adis

Genus: *Raptophasma* Zompro

Species: *R. kerneggeri* Zompro *Raptophasma* sp.

Genus: *Praedatophasma* Zompro and Adis

Species: *P. maraisi* Zompro and Adis

Genus: *Tyrannophasma* Zompro, Adis and Weitschat

Species: *T. gladiator* Zompro, Adis and Weitschat

Natural History of the Mantophasmatodea

The Mantophasmatodea are hemimetabolus, undergoing an incomplete metamorphosis. Females are longer and broader than males in each species examined to date. The South African species are up to two centimetres long, while *T. gladiator* of Namibia has been found up to four centimetres in length. All mantophasmid species are apterous throughout metamorphosis lacking any rudiments of wings, even as adults.

The gladiators of the Brandberg are aggressive carnivores, leaping on their prey and capturing them with both their fore- and middle legs. In the field, gladiators have been observed feeding on small moths, silverfish and cockroaches (Adis *et al.*, 2002). They are nocturnal, hunting at night and hiding amongst plants and rocks by day. The South African species have been reared in the laboratory and use their short and spined raptorial forelegs to grasp prey such as leafhoppers and small flies (M. Picker pers. com.). They also appear to be nocturnal and are always associated with vegetation, being found at the base of grass clumps or at the base of the spiny shrubs of the Succulent Karoo (M. Picker pers. com.).

Field studies in the Western Cape Province of South Africa by Picker and co-workers have revealed that breeding occurs in the spring, with eggs developing during the dry summer. Juveniles hatch and develop during the wet months of the Cape winter. They eat their moults and have at least four instars (M. Picker, pers. com.). Reaching maturity in spring, the adults only survive a few weeks. There appears to be little courtship – males simply leap aboard females and mating commences very rapidly. The smaller males are carried around by their larger spouses during an extensive period of copulation which has been observed to last up to three days (Plate 14). In the laboratory situation, the female has been observed to eat the male after mating (M. Picker, pers. com.). Approximately 12 very large eggs are laid in a cocoon made of sand granules glued together, the egg case being deposited just below the surface of the ground (M. Picker pers. com.). Japanese embryologists Koji Tojo and Ryuchiuro Machida are currently studying the development of the eggs.

Little information is available at present on the development of the gladiator (*T. gladiator*), other than that the nymphs grow very fast in the wild. This may be important since the rainy season in the Brandberg is short, lasting just a few months (Adis *et al.*, 2002). The live gladiator specimens collected from the Brandberg are being reared in the climate chambers of the Max Planck Institute and this should reveal interesting insights into this species (O. Zompro, pers. com.).

Studies on the ethanol-preserved Namibian female specimen (*M. zephyra*) revealed about 40 oval eggs in the abdomen (*Klass et al.*, 2002). Electron microscopy was used to examine the structure of these eggs and it was found that they are submersion-resistant by virtue of plastron respiration, also found in some phasmids. The eggs most strongly resemble those of the Grylloblattodea (Zompro *et al.*, 2002).

Concluding remarks

There are obviously many questions that arise from the discovery of the Mantophasmatodea. The phylogenetic position of the order remains unclear. How closely are these insects related to the Grylloblattodea and Phasmatodea? Further morphological studies will help but it is also likely that DNA sequencing (currently being conducted by laboratories in Leeds, UK and Utah, USA) will clarify this issue. Much taxonomical work is needed to classify the newly discovered species. The captive rearing of mantophasmids, which is underway will permit courtship behaviour, mating, egg-laying and feeding to be studied. However, further collecting trips and observation in the field will also be important for a thorough description of their biology.

So far, living specimens of the Mantophasmatodea have only been found in eastern Africa (Tanzania) and in the southwest of the continent (Namibia and the Western and Northern Cape Provinces of South Africa). The majority of species found to date occur in the Succulent Karoo and Cape Fynbos regions of South Africa. Although they do not appear to be rare, populations tend to be scattered and localised (M. Picker, pers. com.). The *Raptophasma* specimens in fossilised Baltic amber suggest that the extant African species are probably the remnants of what was once a larger and more widespread order. It is likely that the fossilised species from the pre-European mainland became extinct when the climate changed at the end of the Eocene (Zompro *et al.,* 2002). However, the current distribution of the living species suggests that the Mantophasmatodea are unlikely to be found in other parts of the world.

Finally, it is perhaps surprising that, despite the intensive entomological studies that have been conducted over the last few centuries, such a comparatively large insect has remained overlooked until now. It is possible that this was due to their resemblance to juvenile stages of mantids and stick insects. Although the description of a new order of insects appears to be a "once-in-a-century event", it is highly likely that further mantophasmid species will be discovered in the coming years.

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Web sites

http://www.mantophasmatodea.de/

http://www.museums.org.za/bio/insects/mantophasmatodea

Autumn Ringlet plus others at 2100m

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I was very surprised to find Autumn Ringlet (*Erebia neoridas*) at 2100m on 16th August 2001. Tolman (1997) only records this species up to 1600m. To my satisfaction, Lafranchis (2000) records this species up to 1600m but, in parentheses, indicates it possibly may occur up to 2100m. My identification, although in no way uncertain, was corroborated by this discovery in the literature. My site was near the Col de Larche, where I was looking for the Larche Ringlet (*Erebia scipio*). I am pleased to report that I found two females and two males of the latter species in reasonable condition at the same altitude of 2100m. One of the females laid about ten eggs in a small plastic box before I could photograph her 45 minutes later. The eggs hatched, but true to my form with rearing, they all failed to survive the winter. The next day Hannah humoured me on my birthday and allowed me to re-ascend to 2000m where I was more than pleased to locate another local Ringlet – the False Mnestra Ringlet (*Erebia aethiopella*). This is a beautiful part of the Alps, well recommended for a visit to explore the numerous blind valleys of this area rich in wildlife.

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British Oil Beetles (Meloidae): Current progress

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Introduction

Anyone trying to find information about the British Oil Beetles (Meloidae) could be forgiven for thinking that they could still find the majority of British species in the field, depending on which text they were studying.

The British Red Data Book for Insects (Shirt, 1987), lists the **Autumnal Oil Beetle**, *Meloe autumnale*; **Short-horned Oil Beetle**, *Meloe brevicollis*; **Scarred Oil Beetle**, *Meloe cicatricosus*; **Rugged Oil Beetle**, *Meloe rugosus*; and even the **Rainbow Oil Beetle**, *Meloe variegatus*; as RDB3 (Rare) species; and ***Apalus muralis*** as RDB1 (Endangered).

In a later review, Hyman and Parsons (1992) consider the Rainbow Oil Beetle to be extinct, and the Autumnal Oil Beetle, Scarred Oil Beetle, Short-horned Oil Beetle and *Apalus muralis*, to be RDB1 species. In this text, the Rugged Oil Beetle, *Meloe rugosus*, is recorded as RDB3; the **Violet Oil Beetle**, *Meloe violaceus*, is recorded as a Notable B species; and the **Spanish Fly**, *Lytta vesicatoria*, is recorded as a List 2 species (Non-established immigrant species of doubtful occurrence or status).

Ramsay (2002) provides a more pragmatic analysis, and considers the Scarred Oil Beetle (last recorded in 1906 from Kent), and the Rainbow Oil Beetle (last recorded in 1882 in Kent) to be extinct, along with the **Polished Oil Beetle**, *Meloe decorus* (a probable vagrant (Mann, 2002) recorded once in 1870), and the **Mediterranean Oil Beetle**, *Meloe mediterraneus*, (apparently misidentified as *M. rugosus* in a batch of 19th century specimens in the Natural History Museum).

Ramsay considers the RDB1 species: the Autumnal Oil Beetle (last recorded in Essex in 1952), and the Short-horned Oil Beetle (last recorded in Sussex in 1948), to be worth searching for in suitable localities, and John Walters' recent discovery of the Rugged Oil Beetle in Dorset (see previous article; p.48) offers a glimmer of hope that these rare and elusive species may yet be rediscovered in suitable habitats.

The article by Ramsay (which considers species of the genus: *Meloe*) provides details of the three species for which there have been recent records: the Rugged Oil Beetle (RDB3), the Violet Oil Beetle (Notable B), and the **Black Oil Beetle**, *Meloe proscarabaeus* (which is regarded as a "local" species in Britain). An identification key for the British *Meloe*

species; brief details of the complex life-cycle of these species (including an illustrated list of the likely ground-nesting solitary bee hosts of oil beetles); and diagnostic colour illustrations of the species most likely to be discovered; are also provided.

Why have British oil beetles disappeared?

British oil beetles are brood parasites of ground-nesting solitary bees. The decline in the quantity and quality of suitable habitats in Britain over the last century has had a very serious impact on the fortunes of the solitary bees upon which these beetles depend for their survival. However, much as this simple fact holds water, and much as the loss of host species from suitable sites has probably been the major cause of the local and national disappearance of British oil beetles, it is also clear that we do not have enough information to satisfactorily explain other factors that may have a bearing on their undoubted demise.

It is also the case that many of these often secretive (*e.g. Apalus muralis*) and highly specialised insects have always been exceptionally rare. Joy (1932) certainly records the Rugged, Scarred, Autumnal, Short-horned and Rainbow oil beetles as "very rare". It is possible that their historical rarity may be explained by host specificity, *i.e.* the host species itself may be local or rare as a result of its specific temperature and habitat requirements. (This host-bee specificity is obviously post-arrival at a suitable nest, *i.e.* the correct species is not chosen at the site of contact. Triungulins have been observed to "climb aboard" any hairy insect that visits the host flower, including some Diptera, and this "hit or miss" approach underpins the need for the vast egg-laying capacity of the female oil beetle*.) In addition, many of the significant number of solitary bee species listed as "Endangered" or otherwise in the (Consultation Paper for the) Fourth Quinquennial Review (2001) of the Wildlife and Countryside Act, (some of whom may have been host species for oil beetles), have always been considered to be scarce or rare in Britain (David Baldock, pers. comm.).

Nevertheless, it is always possible that isolated pockets of these extreme rarities may still exist. The recent discovery of the Rugged Oil Beetle in Dorset suggests that the key to relocating these "lost" species may lie in the identification of suitable sites which are known to have a (preferably uninterrupted) history of host species presence (as opposed to the intensive study of sites from which species are long-since known to have disappeared.)

* 2-10,000 eggs for *Lytta*, and one specimen of *Meloe proscarabaeus* was found to contain 4,218 mature eggs (Linssen, *loc. cit.*).

What are the host bee species?

Hyman and Parsons (*loc. cit.*) conclude that the Rugged, Scarred, Autumnal, Short-horned, Rainbow and Violet oil beetles probably parasitize *Anthophora* and *Osmia* species in Britain.

Ramsay (*loc. cit.*) provides (with illustrations) the following list of possible hosts for British oil beetles (from most likely association to least likely): *Andrena cineraria*, *Andrena flavipes*, *Andrena haemorrhoa*, *Andrena wilkella*, *Anthophora plumipes*, *Lasioglossum calciatum*, but does not provide any specific oil beetle-bee associations. Interestingly, no mention is made of *Osmia* species, which appear to be regarded as potential hosts by other authors. However, available species accounts provided by Edwards for a number of British *Osmia* species (1997, 1998) show that with the possible exception of the endangered *Osmia xanthomelana*, which nests in sandstone and chalk cliffs on the Isle of Wight, no other species are likely to be potential hosts. (The widespread species, *Osmia rufa*, does not appear to be a suitable ground nesting species).

Whitehead (1990) suggests that *Andrena haemorrhoa* and *Anthophora plumipes* are the potential hosts for the Rugged Oil Beetle.

Rye (1866) provides a remarkably detailed account of the early life history of *Meloe*, and it is apparent that this process must have been observed. The final transformation to the adult stage is provided by analogy with *Apalus muralis*, (for which this process has been observed) and it is for *A. muralis* only, that a host bee genus (*Anthophora*) is described.

Shirt (*loc. cit.*) states that the *Apalus muralis* is probably chiefly associated with *Anthophora plumipes* and *Anthophora retusa*, but has also been found in the nests of *Bombus terrestris*.

Linssen (1959) states that *Meloe* larvae parasitize *Anthophora* bees in Britain and *Osmia* species abroad (they are also known to parasitize Orthoptera of the genera *Dociostaurus*, *Caliptamus*, *Melanoplus* and even *Locusta* abroad), and that the Violet Oil Beetle is known to parasitize *Panurgus dentipes* abroad. (A similar species, *Panurgus banksianus* is known to frequent sandy habitats in Britain.)

Linssen also states that unlike *Meloe* species, *Lytta* is known to deposit eggs in the burrows of solitary bees, but does not provide details of which species are parasitized.

Apalus muralis is described as parasitizing *Anthophora plumipes*; and its European relative, *Apalus analis* parasitizes *Colletes succinctus*, a potential host species found in Britain.

The role of Buglife – The Invertebrate Conservation Trust (BICT)

Buglife – The Invertebrate Conservation Trust, is a new organisation devoted to the conservation of UK invertebrates. One of the first projects undertaken by BICT was the Oil Beetle Project, which aims "to assess the current distribution of oil beetles in Britain and to investigate their host associations in order to establish reasons for their decline" (Ramsay 2002). It is hoped that the various phases of this project, which will collate data over a three year period, will lead to the provision of this information and the production of accurate distribution maps for all extant species. (Hopefully, a corresponding list of potential sites containing suspected host bees will be disseminated to various groups during the course of this project, in order to maximise the provision of data regarding the investigation of these sites.)

Where can *Meloe* species be found?

Hyman and Parsons (1992), and Ramsay (2002), provide details of the last known sites for species which have not recently been recorded, and the known distribution of those that have. Details of the habitats in which they can be expected to occur are also given.

The adults for each prospective species should be sought after at the appropriate time of year and are unmistakable when discovered (although the adults of some species can be surprisingly small *e.g.* less than 10 mm).

It is also worth checking for triungulins in suitable habitats, perhaps even using a "placebo" bee mounted on a cocktail stick, and a hand lens, to determine their presence on flower heads. According to Rye (*loc. cit.*) these larvae are like:

> "bird-lice, being yellow, elongate, parallel flattened, with rather long legs, and four long hairs at the apex of the last segment. They appear to remain torpid for some time; but, when once roused by sufficient warmth, exhibit extraordinary activity in traversing low plants, chiefly *Ranunculaceae* or *Chicoraceae*. From these they attach themselves, often in great numbers, to the hairy covering of bees as they settle on the flowers of their temporary lodgings, and also, sometimes, to certain hairy *Diptera*, or two-winged flies, which closely resemble wild bees."

Discovery of *Meloe proscarabaeus* in Bedfordshire.

Ramsay (*loc. cit.*) states that care should be taken when distinguishing the Black Oil Beetle, *Meloe proscarabaeus*, from the Violet Oil Beetle, *Meloe violaceus*, and an oil beetle discovered on chalk downland in Bedfordshire last year exemplified this point. Plate 6 shows a female

specimen of the Black Oil Beetle found on chalk grassland at Totternhoe quarry in Bedfordshire, (23.v.02). I had photographed the Black Oil Beetle in Devon previously, and when I saw the metallic blue hue of the large female that appeared in front of me, I immediately assumed that it was a specimen of the Violet Oil Beetle. More confusingly, prior to looking in Joy (*loc. cit.*), I looked through a number of books which depicted virtually black Violet Oil Beetles. Joy, to be honest, was not much help since the description of characters regarding the differences between these two species is comparative and dependent upon ones interpretation of "more strongly rugose" and "more finely punctured". Also, as ever, only experience of both species provides the immediate ability to understand the term: "thorax with transverse impression at basal margin", a feature which could not initially be ruled out in this specimen (*e.g.* see figure 3 in Ramsay's article), but which, upon comparison with a specimen of the Violet Oil Beetle, was immediately quashed.

Ramsay states that females of the Black Oil Beetle are always jet-black, and a photograph of this species in that article shows a specimen for which this is the case. The female found at Totternhoe is exactly the same hue as the specimen of the male Violet Oil Beetle depicted in a photograph in that same article, and might be considered by some to be the rare violet form of this species; *Meloe proscarabaeus* v. *cyanea* (Mulsant), but again, in the absence of a bona fide specimen of such a variant, that diagnosis remains open to speculation.

What of *Lytta vesicatoria* and *Apalus muralis*?

Lytta vesicatoria

In 1866, Rye (*loc. cit.*) considered *Lytta vesicatoria* to be a well-known species which is "occasionally taken in southern counties, but can scarcely be considered as truly indigenous."

Wood (1871) states that there are some doubts among "practical entomologists" as to whether this species is indigenous or not, but states that: "If it be a foreigner, it has, at all events, settled so completely in several parts of England, that it may be considered as a naturalized Briton."

Hofman and Kirby (1902) considered this species to be rare in Britain, appearing in some years in large numbers on oaks, elder and privet. (This is in keeping with an as yet unconfirmed report of the appearance of many adults on a tree in Kent in the 1940s.)

Recently, this species has re-established itself at possibly more than one site on the south coast of England, and if current climatic trends are continued, may become a permanent breeding resident.

Apalus muralis

This small (8-10 mm) but unmistakable species was recorded as being "taken in plenty at times in the Iffley/Littlemore/Cowley /Wheatley/Wolvercote areas around Oxford in the early years of this century up to the mid-1940s, it has not been seen since" (Shirt, *loc. cit.*). Hyman and Parsons (*loc. cit.*) state that the last record for this species was from Wheatley in Oxford, 1969.

This species, in spite of its long-standing RDB1 status, was regarded by many to have probably become extinct (*e.g.* Harde, 1981).

It has recently been rediscovered at two sites in the London/Kent area, both of which are threatened with development (Alex Ramsay, pers. comm.).

It appears that in the light of recent findings, and with a concerted effort to rediscover our "lost" species, the British Meloidae may still have the ability to provide the odd surprise!

Do you have any oil beetle records?

All records of oil beetles (6-figure grid reference, number of adults seen, habitat description) will be gratefully received, and can be sent to:

1) **Buglife – The Invertebrate Conservation Trust**, PECT, High Street, Fletton, Peterborough, PE2 8DT.
2) **Dr Roger Key** (Recording Scheme Coordinator for the national Tenebrionoidea, Lymexyloidea and Cleroidea (which includes oil beetles) at: English Nature, Northminster House, Peterborough, PE1 1UA.

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Sincere thanks to: Alex Ramsay, Darren Mann, Peter Hodge, John Walters, Tony Allen and David Baldock for the provision of information and useful discussion.

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Artificial Feeding of Butterflies and Moths

by Graham Best (7928)

12 Hortham Lane, Almondsbury, Bristol, BS32 4JH.

Under the highly artificial or out of season conditions of breeding butterflies and moths in captivity, it is recommended to supplement or completely supply their diet with dilute solutions of honey or sugar. Most advice is rather generalised. It might be that a closer look at their nutritional requirements may be beneficial in terms of pairing, fertility, egg-laying capacity and length of life, especially in species hibernating as an adult.

Water

Anyone who has bred insects in a cage and sprayed them to provide humidity will have seen how avidly butterflies seek out water droplets to drink. Gathering at mud puddles, carrion, moist brick dust or human perspiration is a common phenomenon which may simply provide water as well as other beneficial nutrition. While butterflies are doing so, it has been observed that they may rapidly excrete water which may contain unwanted substances. Tap water contains chlorine compounds. It may be advisable to stand the water for 24 hours, or to provide rain water or bottled water, which may contain other beneficial minerals.

Minerals

Minerals may be imbibed accidentally or deliberately at non-flower water sources. Potting compost contains added minerals for plant nutrition, and butterflies may seek this out, especially when added as a damp layer to provide humidity in a cage.

Carbohydrate

Insects obtain their carbohydrate from nectar in flowers. Analysis has shown that the main constituents are an approximately 20% solution of sucrose, glucose and fructose, which, in the case of *Buddleia*, is in a proportion of three times as much sucrose as glucose and fructose. Both of the latter are available in health food shops and some supermarkets. It may be worth considering these constituents when making up sugar solutions. Refined white sugar is a fairly pure form of sucrose. Although used for sugaring for moths, curiously I have not seen brown sugar or molasses advocated for artificial feeding of captive Lepidoptera. It may be that the smell may help attract insects to the feeding pad.

Protein

Nectar contains about 10 amino acids, which are the building blocks of protein. It has been shown that some species require protein in their diet. Nectar also contains adventitious pollen, which contains protein that may be imbibed with the nectar. Some moths actually feed on pollen with primitive mouthparts. Butterflies seen on carrion and animal droppings may be obtaining protein in this manner. It has been shown that butterfly pollinated flowers produce nectar richer in amino acids than other species.

Vitamins

Vitamins in human beings are provided for in a balanced diet and by sunshine. Like many aspects of insect nutrition, there is little known about this requirement.

Honey

Dilute solutions of honey, up to concentrations of 50% for hawkmoths, are advocated as an alternative to sugar. It may be that the honey making process of bees might make honey a more diverse source of nutrients, different sugar proportions and a better source of energy for

Lepidoptera. As sold, honey may only contain 80% sugars, compared to refined granular sugar. This should be allowed for when diluting. Most honey sold in supermarkets in this country is imported. Despite more recently improved labelling, the contents may include added substances, which British beekeepers hint darkly at. A better source may be health food stores or even better, seek out a local beekeeper who may know the major source of the nectar in the honey. There may be implications for lepidopterists for honey from genetically modified plants that we may only guess at. I would try to avoid Oil seed Rape honey, which has a tendency to solidify easily.

Proprietary nectar foods

In America and other countries lucky enough to have Hummingbirds visiting their gardens, proprietary nectar containing foods are quite big business. Food for the nectar-feeding cage birds in this country are catered for in the specialist bird publications. With birds having differing nutritional requirements, there may be added nutritional supplements and some of the constituents may be superfluous to the requirements of insects. However, this is an area that might be explored.

Sources

Much of the information in this article has been from personal experience and communications, supplemented by articles in the A.E.S. Bulletin, books on Lepidoptera and the internet. It may be that those with greater experience or access to scientific journals may be able to add to the sum of our knowledge.

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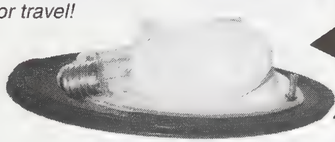

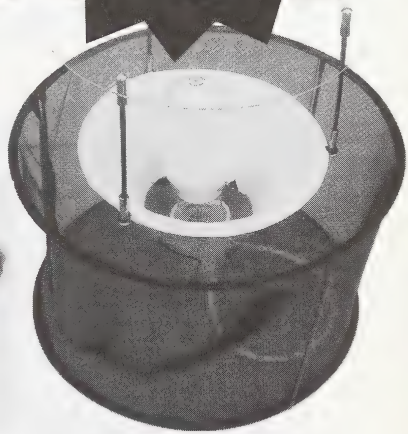

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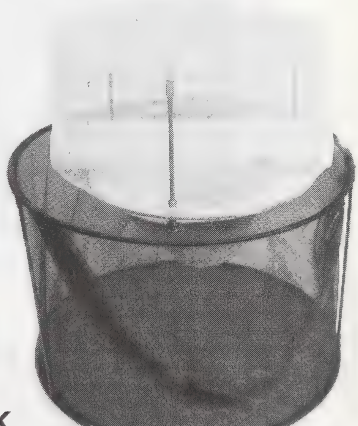

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Nocturnal Pursuit

The cover of the *Bulletin* shows a pair of courting Stag Beetles *Lucanus cervus* discovered at Bushy Park (a royal deer park) in Middlesex. This imposing and globally threatened species, which could easily be an emblem for what has recently been described as Europe's greatest urban forest (London) is Britain's largest terrestrial beetle. An article describing the British members of that Stag Beetle family (Lucanidae) will appear in the December issue of the *Bulletin*.

The Bulletin
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Editorial

Welcome to the June issue of the AES *Bulletin*. I would like to thank everyone who has contacted the Society over the past few months regarding the content of the *Bulletin*. Fortunately most has been very complimentary! However, we are keen to hear your views, good or bad, so that we can continue to improve.

The Society is looking to the future. We are keen to raise our profile and would like to enlist the help of members. Please look at the Announcements, Requests and Replies section for further details.

The full insect season is now upon us. As I write this editorial, it is a beautiful hot day – perfect for insects. So I hope you are all getting out there investigating insects and noting everything down. We would love to receive your studies for inclusion in future issues of the *Bulletin* – so please send them in!

My final note is to congratulate all those who spotted the deliberate mistake on the cover of last issue (Number 447). Several of you correctly identified the hymenopteran in the photograph as an adult of the Figwort Sawfly *Tenthredo scrophulariae* Linnaeus, 1758, (Hymenoptera: Tenthredinidae) not *Dolichovespula norwegica* (F.) as described. In fact we have even had further information provided by John Grearson (11996) and Andrew Halstead. This is summarised here.

The Figwort Sawfly *Tenthredo scrophulariae* has caterpillar-like larvae that feed on the foliage of figworts (*Scrophularia* spp.) and dark mullein (*Verbascum nigrum*). It is of widespread occurrence with adults occurring in early and late summer. There are several other *Tenthredo* species with yellow and black striped abdomens but *T. scrophulariae* is easily recognised as it is the only British species with brown antennae and shaded wings. Of the British social wasps, only the hornet has brown antennae; those of *Vespula* and *Dolichovespula* species are black, although the latter have a yellow patch on the two basal segments (the scape).

AES Exhibition 2002 – Exhibit reports

The following reports were received for the exhibits at the AES Exhibition for 2002.

Large Copper (*Lycaena dispar batavus*) aberration - Peter May (10514)

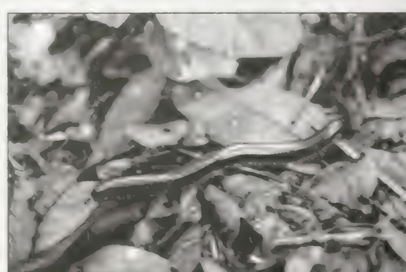
E-mail: petermay71@hotmail.com

A female of the species was exhibited showing an abnormally pale coloration over a large part of the left forewing. This specimen appeared as part of a long-term captive bred stock. No references to this type of aberration in this species have been found in the literature although partial bleaching is well documented amongst the Satyridae.

Sabah Borneo. September 2002 – Kevin Chuter (6212)

Mount Kinabulu park HQ Kian view trail. Two animals seen on the forested lower slopes of Mount Kinabalu. The area is not true rain forest, but humidity is high and cloud comes in quite suddenly. The millipede is unidentified and was about 15cm long, a smaller entirely red one was also seen. The beetle is a mature female of the "Trilobite beetle" *Duliticola paradoxica* (4.5cm long). The females of this species retain their larval form to maturity as do the British "glow worms" of the family Lampyridae. Both specimens were found on the trail.

The 'trlobite beetle" *Duliticola paradoxica*



Unidentifed millipede

Exhibit By Keith C. Lewis (3680)

E-mail: kc.lewis@btopenworld.com

The case exhibit contained seven *Arhopalus rusticus* (L.) (Cerambycidae) beetles, three of which were collected during three months' stay in the 1950s at Grantown-on-Spey, Inverness-shire Scotland NJ0328. The other

four beetles were all from Kent together with a note advising the procedure for breeding this insect from the larval stage. The exhibitor has bred numerous *A. rusticus* from larvae found over a considerable number of years in wind-snapped pine trees. A separate map showed dates and site locations in Kent where this beetle had been found.

The Azores Graylings (*Hipparchia* species) - P.J.C. Russell (8977)

Some examples of both males and females, shown recto and verso, of the Grayling butterflies found on the Azores. This Portuguese archipelago is situated almost in the centre of the North Atlantic Ocean and consists of nine volcanic islands, of which seven have ground high enough above sea level to give rise to the wet meadows inhabited by these species.

The islands are divided into three groups: an Eastern group, consisting of Sao Miguel where *Hipparchia miguelensis* is found and Santa Maria, which is not high enough to have suitable habitat. The Central group consists of five islands, of which only one, Graciosa, does not have suitable habitat. *H. azorina* inhabits the remaining four islands, with the nominate subspecies *azorina* on Pico, *jorgense* on Sao Jorge, *barbara* on Terceira and *ohshimai* on Faial. The Western group consists of two islands: Flores and Corvo, both of which are occupied by *H. occidentalis*, with subspecies *minor* on Corvo. The display showed that some species are rather different from one another. Others show a very similar wing morphology and probably should be separated only at subspecific level. Some subspecies possibly do not merit division at all and represent only variation within a common stock. Recent biochemical studies suggest this latter situation may well be the correct interpretation of this group of interesting and obviously closely related island forms of the Azores Graylings.

The American Painted Lady *Vanessa virginiensis* (Drury) and the West Coast Lady *Vanessa carye* Hubn. – Peter Baker (9086)

My exhibit was prompted by the article in *Atropos*, Number 16, April 2002. I hope it will help those trying to separate the American painted lady from its European counterpart.

The left hand column of the display showed upper and under sides of both sexes of the American Painted Lady *Vanessa virginiensis* (Drury). These were from the easternmost side of the USA at locations as far apart as Florida in the south to New Jersey in the north. The centre row showed the upper and under sides of the Painted Lady *Vanessa cardui* L. from various sites in New Jersey, USA. The top three in the right hand row were English examples of the Painted lady. West of the Mississippi

the American Painted Lady is replaced by the West Coast Lady *Vanessa carye* Hubn. An example of which is shown at the bottom of the right hand row.

The difference in markings between *virginiensis* and *cardui* is greatest in the larger size of the hindwing eyespots of the former. In flight the greater degree of indentation of the outer margin of the forewing of *virginiensis* is characteristic. It will be noted that American bred *cardui* can be considerably larger than their English counterpart and are generally larger than *virginiensis*. Records of *carye* from England seem unlikely and should be viewed with the greatest suspicion

Note that the overall impression of colouring of all three species is remarkably similar and is unlikely to be a useful aid to identification in the field.

An Australian spider at a garden centre near you? – Andrew Halstead (6346)

In April 2002 a spider was brought to the RHS Garden, Wisley for identification. It had been found by staff at Squire's Garden Centre at Hersham, Surrey on a plant of the tree fern, *Dicksonia antarctica*. Tree ferns have become popular plants in sheltered British gardens in recent years. They are imported from Australia as dormant "trunks"; some of these are up to 2m tall and of considerable age. Once planted the trunk produces a crown of leaves and resembles a small palm tree.

The fibrous nature of the trunk provides an opportunity for invertebrate animals to hide. The spider from Hersham was a mature female and produced an egg mass in May. These hatched on 14.6.02, the female dying about a fortnight later. The tangled web produced by the spider is of the type designed to trap crawling insects. The adult and the offspring readily feed on a variety of flies that have been given to them.

The spider has been tentatively identified from pictures of Australian spiders found on a website (how else would you identify spiders?!). It is believed to be a *Badumna* sp., possibly *B. insignis*. If this identification is correct, it is only a moderately poisonous spider.

Pieris Lacebug (*Stephanitis takeyai*) - Andrew Halstead (6346)

This sap-feeding pest was first detected in Britain in the Savill Garden at Windsor Great Park in 1998. It originates from Japan but has become established elsewhere in Europe. The nymphs and adults live on the underside of the foliage, causing a coarse pale mottling of the upper leaf surface. The underside of the leaves is marked with the lacebug's tar-like

spots of excrement. Pieris Lacebug also attacks at least some *Rhododendron* spp where it causes similar damage. This can be confused with damage caused by the closely related Rhododendron Lacebug (*Stephanitis rhododendri*) which became established in Britain in the early 1900s.

Staff at Savill Garden have cooperated with the Plant Health and Seed Inspectorate (PHSI) to try and eradicate this pest. However the sample on display came from a private garden at West Byfleet, Surrey – at least eight miles from Windsor as the bug flies. The *Pieris* plant at West Byfleet is at least 15 years old but the pest damage was only noticed this year. If Pieris Lacebug has become established in private gardens, attempts at eradication will probably be abandoned and this will be one more pest for gardeners to contend with.

If you find this lacebug in your garden, please send me a sample, with details of the locality, at Andrew Halstead, RHS Garden, Wisley, WOKING, Surrey, GU23 6QB.

A brief introduction to the Saturniidae – Mark Pickup (5749)

A Short guide to the life history of Silkmoths, illustrated with various photographs and set specimens. Also present was a cage containing livestock of different Silkmoth species being reared by the exhibitor this year. The display contained living larvae of *Citheronia splendens*, *Eacles Oslari*, *Lonomia venezuelensis*, also *Rothschildia triloba* moths.

Insects from Spain, Summer 2002 – David Keen (3309)

As usual, my exhibit this year was based on the insects found around our friends' villa in Spain. The summer of 2002 was an exceptionally hot and dry one, even by local standards, with no rain from May until a shower during our visit in September. Thus, in September there was very little insect life to be seen. Even the swimming pool which yielded a least a dozen insects every morning in previous Septembers was mostly devoid of life this year.

In the left hand case was a male Emperor Dragonfly, *Anax parthenope* Selys with a specimen of our own *A. imperator* for comparison. The Spanish one flew up the garden path just before 1am on 11th September, attracted by the light from the bedroom window. The other specimens were all taken from the pool during the summer and include a large queen ant; one of three worker wasps which resemble *Vespula germanica* Lin. but with different facial markings; two female Leopard Moths, *Zeuzera pyrina* Linn and a Tiger Moth.

The two Eggars were fished out of the pool in September 2001. I obtained a few eggs from the female and reared the resultant larvae on grasses but they perished during my next holiday in Spain at the end of the year. One of the larva was preserved as is one found on the wall of the villa in June this year.

In the right hand case were specimens of the Spanish Tiger Moth. *Cymbalophora pudica* Esper. Not only does this moth have a considerable variation in the wing markings – as in the five specimens shown – it also has an unusual life history (see Keen. 2002).

Reference

Keen. D. (2002) Strange goings on with a Spanish Tiger Moth. *The Bulletin of the Amateur Entomologists' Society* Vol 61, No 445, p244.

Mimetic Butterflies – A display of some of the best known examples of mimicry in butterflies – Yealand Kalfayan, Bristol. October 2002

This display showed representative examples of mimetic butterflies from around the world. In each instance the relationship between the butterflies is essentially batesian, i.e. the unpalatable model butterfly is imitated by a palatable mimic. The former species is protected from predators by a clearly recognisable colour pattern and an offensive or poisonous taste. The mimetic species has evolved a similar pattern and, though edible, derives protection from the same predators by deception. Not all mimetic butterflies are equally convincing however. The display contained mimics of varying "perfection". A number of explanations were suggested.

I am most grateful to those fellow enthusiasts who have donated, exchanged, lent or sold specimens for this display.

Photographs of British butterflies – Chris Gardiner (5249)

Colour prints of native butterflies including the following:

Holly Blue, *Celastrina argiolus*, feeding on a bird-dropping; Large White, *Pieris brassicae*, feeding on *Aster*; Small Copper, *Lycaena phlaeas* f. *caeruleopunctata*; Small Tortoiseshell, *Aglais urticae* var. *semiichnusoides*; Speckled Wood, *Pararge aegeria*.

Paysandisia archon

Part 1 – Mike Perry, Donnington, Chichester

The moth later identified as *Paysandisia archon* was first seen flying in mid-afternoon, 13th August 2002 in the garden of Barbara and David

Stear in Bosham, near Chichester, West Sussex. The weather was warm, humid and sunny with little cloud and a light SW wind. The moth was large – David Stear's commented "at first sight it looked like a small bird". It eventually settled on a fence and was caught.

Barbara and David were unable to identify it from available books, but their next-door neighbour, a member of the Chichester Natural History Society, remembered that the current Chair of the CNHS [MP] is very keen on moths. The moth was collected from Bosham the following day and brought to Chichester. Here it was photographed and handed over to the Chair of the Sussex Moth Group [SJP].

Apart from its colouring, the most striking features of the moth were its size and strength. While being prepared for photography by MP, the moth gave a series of slow arching contractions in which the wings were pressed downwards and the thorax raised – in much the same way as seen with Privet Hawks *Sphinx ligustri* and Poplar Hawks *Lao thoe populi* when disturbed. However the contractions produced by *archon* were more powerful than those produced by the two hawk-moths.

Part 2 – Sarah J. Patton, Kingsham, Chichester

The moth was handed over to me and I began a journey of discovery. I learned that the moth was *Paysandisia archon* from South America. It feeds on various palms and, as a pest, it was first found in the Riviera in 1913 where it developed abundantly in 1927 and 28 before being wiped out by the cold winter of 1929.

It was probably introduced to Spain between 1985 and 1995 on palms from Argentina. In 2001, it was found in France near Hyeres with numerous dead palm trees in several nurseries. It is thought that it was introduced in 1997 on imported palms from Argentina.

Currently, it is a pest in Spain, France and Italy, but this is the first record from the UK. Many palm species have been affected. Although the genus is generally nocturnal, this species is diurnal. It possibly has a biannual life cycle.

The eggs are laid at the base of leaf petioles, are the size of a grain of rice and grooved. They hatch in early summer (only two to three days

after laying) with 10-12 eggs per palm tree. The larvae, which are orange initially, start by infesting the stalks of leaves and flower shoots in the heart of the plant. As they develop they become creamy-white and dig wide galleries into the heart of the tree where they spend 11 months, causing significant damage or even death. The chrysalis is chestnut red and develops between the petioles of the palm in a cocoon of vegetable fibre.

No infected plants have been detected in Sussex by DEFRA.

Part 3 – Was it imported or did it migrate?

Trapping in Donnington (4kms due east of Bosham) and in Kingsham (another km to the east) over the preceding week produced some indications of migrant activity:

		Donnington	**Kingsham**
Weds. 7th August	*Plutella xylostella*	1	8
	Nomaphila noctuella	4	36
	Udea ferrugalis	3	1
	Gem	1	1
	Silver Y	3	1
Thurs. 8th August*	*Plutella xylostella*		3
	Nomophila noctuella		2
	(Udea ferrugalis		2
	Silver Y		5
Fri. 9th August*	*Plutella xylostella*		14
	Nomophila noctuella		6
	(Udea ferrugalis		5
	Gem		1
	Silver Y		6
Sat. 10th August	*Plutella xylostella*		5
	Nomophila noctuella		3
	(Udea ferrugalis	1	2
	Dark Swordgrass		1
	Silver Y	3	3
Sun. 11th August*	*Plutella xylostella*		4
	Nomophila noctuella		1
	Udea ferrugalis		2
	Silver Y		2
Mon. 12th August	*Plutella xylostella*	1	3
	Nomophila noctuella	3	12
	Lidec ferrugalis	1	2
	Silver Y	2	2
Tues. 13th August	*Plutella xylostella*		3
	Nomophila noctuella	3	6
	Bedstraw Hawk	1	
	Small Mottled Willow		1
	Silver Y	1	

* – no trapping took place at Donnington because of rain

Sussex Cerambycids – B.R.Moon (9313)

A portfolio of photographs, including species in habitats, of Sussex Cerambycids, with supporting descriptions and comments on status.

Saturniidae of Eastern Ecuador reared during 2002 – D.J. Moon (3850)

A photographic display of the life stages of Hemileucinid species including *Automeris curvilinea, A. hamata, Periphoba hircia* and *Pseudoautomeris latus* reared on the leaves of British garden shrubs and trees from livestock collected by Mr Leroy Simon in the area of Misahualli, E. Ecuador. Living larvae of *Automeris curvilinea* were shown, feeding on oak. A possible specimen of the Scarce *Copaxa ignescens* reared on Avocado in 1990 from Ecuadorian ova was also shown (stock collected by Mr Daniel Herbin of France).

Insects Of South Africa –Natalie Lawrence

This exhibit won the Ansorge Award for Exhibits by Junior Members

Last Christmas I went with my family to South Africa for three weeks, from December to January. We stayed for most of the time in a house in Cape Town and went on safari in Medikwe Game Park, situated on the border of Botswana, for the last five days. The weather was very good and during that time I built up a general collection of the insects I found there, which I exhibited at the last Annual Exhibition in October.

The insects in Cape Town included some species of Lepidoptera and Odonata I netted flying in the garden of the house along with some species of Coleoptera, Hymenoptera, Hemiptera and Orthoptera. The peak time for collecting butterflies and dragonflies was around midday when the sun was hottest. (Unfortunately it is not the best time for humans and I got badly sunburnt on one occasion!) Most days I went out with my net and chased after the Citrus Swallowtails, Hummingbird Hawkmoths and numerous other species in the garden.

The majority of other specimens were found in the swimming pool. Every morning I checked to see if any other insects had fallen in. I found cicadas, the burrowing Mole Crickets, a Robber Fly and two bugs, along with a selection of beetles, all of which I would not have found easily otherwise. Apart from these, I found a Table Mountain Cockroach in the botanical gardens which border Table Mountain. I netted two species of wasp inside the house and one bee in the garden, though I was not able to identify them because of the lack of books on insects in South Africa.

When we went on safari there were more species of insects than I could take in at first. We went for game drives during the mornings and evenings. In the middle of the day I trudged through the long grass hunting insects and returning to my room half fainting but with boxes of specimens clutched in my hands.

There were many more species of insects than in Cape Town. In the day Yellow Pansies, Jokers, Wandering Donkeys and Dancing Acreas flew along with many other species. At night, crickets, giant predatory katydids, mantids, Red Romans and hoards of midges and small moths flew everywhere. On the way back from every dinner I hung around the lights lining the paths and hunted the moths, which flapped drunkenly around them, picking out the more interesting specimens to add to my collection. The mantids hung round the lamps in hope of catching food, though I never actually saw one catch anything, I did see many with prey clutched in their front legs. I only saw the Katydids on two occasions. One was leaping along the side of the lodge building when we had just returned from a drive in the evening. One jumped over my mother's shoulder whilst we were having dinner. These insects have a wingspan of around 12cm and hunt small moths and other insects with their large mandibles.

When we were leaving at the end of the holiday, there were still many species which I wanted to obtain, though by now I had completely run out of equipment and space so I was forced to stop with the specimens I had already captured. These I stored in cigar boxes lined with cork and taped shut for the flight back to England.

Firstly we stayed in Cape Town before going on safari to Medique Game park on the border of Botswana.

Species Found

Lepidoptera

Butterflies

Large White *(Pieris brassicae)*.......... CT
Meadow White *(Pontia helice helice)*.......... M
Twin Dotted Border *(Mylothis rueppellii haemus)*.......... M
*Zebra White *(Pina copteryx eriphina eriphina)*.......... M
Common Blue *(Cyclyrius pirithous)*.......... CT
Common Hair Tail *(Anthene definita definita)*.......... CT
Pale Hair Tail *(Anthene butleri livida)*.......... M
Black Pie *(Tuxentius melaena)*.......... M
Meadow Blue *(Cupidopois cissus)*.......... CT
Golden Piper *(Hypolimnas misippus)*.......... M
Wandering Donkey *(Acrea nesbule nesbule)*.......... M
Dancing Acrea *(Acrea ephonia ephonia)*.......... M
African Clouded Yellow *(Colias electo electo)*.......... CT
Joker *(Byblia anvestara acheloia)*.......... M
Gold Spotted Sylph *(Metisella metis)*.......... CT
Citrus Swallowtail *(Princeps demodus demodus)*.......... CT
Yellow Pansy *(Junonia hierte cebrene)*.......... M
*Painted Lady *(Vanessa cardui)*.......... CT

Moths

Hummingbird Hawkmoth*(Macroglossum stellatarum)*.......... CT

Coleoptera

Cape Mountain Cockroach.......... CT

Odonata

(Brachythemis lacustis).......... CT

Orthoptera

Giant preadatory Katyid*(clonia maculosa)*.......... M
Mole Cricket*(Giyllotalpa africana)*.......... CT
Common Cricket*(Gryllus bimaculatus)*.......... M

Arachnids

Red Roman (*Solifuse* sp.).......... M

* = not in the collection
M = Found in Medique Game Park
CT = Found in Cape Town

Note: only a few of the species I found are listed here because, except for the Butterflies, I had little means of identifying them.

Some 2002 Aberrations of British Butterflies – Graham R Smith (4950)

Typical specimens were included with each aberrant form for comparison

Chalkhill Blue, *Lysandra corridon*, Poda. ab. *obsoleta*, Tutt. (female underside)
Although an extreme aberration this form is not uncommon in some colonies. This example is a bred F2 generation specimen of Gloucestershire origin. Emerged: 16/07/02.

Adonis Blue, *Lysandra bellargus*, Rott. ab. *krodeli*, Gillmer. (female underside)
This equivalent of the *obsoleta* aberration in the Chalkhill Blue is also the most frequent aberration within the species. Wild specimens of both Chalkhill and Adonis Blues, with this variation, are often deformed and can have weaknesses like abnormal wing venation, broken main veins and perforated wings. After emergence, large sections of wing can break free leaving the individual severely impaired or incapable of flight. Reared F1 generation from Wiltshire stock. Emerged: 24/08/02.

Adonis Blue, *Lysandra bellargus*, Rott. (male upperside)
A wild caught specimen, which, initially, seemed to be an intersex or gynandromorph. I believe it shows homeosis, as the underside pattern is repeated on the right upperside forewing. Abnormal wear is also evident in the blue wing scales. Wiltshire: 01/09/01.

Silver Washed Fritillary, *Argynnis paphia*, Linn. (male upperside)
Unnamed aberration with enlarged androconia (male scent scales) on forewings. The sub-marginal spots on the hindwings are slightly confluent though the basal area of the hind-wing is heavily suffused. I believe this is an environmental aberration, due to exceptionally cold conditions in early July causing an increase of melanic pigment. I picked the specimen up, exhausted, from a woodland path. It may have been stung by a hornet? Wiltshire: 06/07/02.

Silver Washed Fritillary, *Argynnis paphia*, Linn. (dimorphic female form. *Valesina*, Esper upperside)
A reared specimen from Wiltshire stock (from a forced batch of larvae) with a pale patch in the centre of each forewing, plus the sub-marginal spot near the tornus faintly marked. Emerged: 14/04/02.

Marbled White, *Melanargia galatea*, Linn. (male upperside)
Minor aberrant exhibiting reduced black markings. I have found this tendency more common in females. B&NES: 12/07/02.

Meadow Brown, *Maniola jurtina*, Linn, ab. *postaurolancea*, Leeds (female underside)
A beautifully rayed example of the commonest British Butterfly with a narrowed hindwing median band broken in two places by a dusting of dark scales. I found a similar specimen before about two miles away in July 1998. It only seems to turn up after examining several thousand female Meadow Browns. Keep a look out for this form - you may not just be looking at fine tears in wings or shadows cast by grass stems! B&NES: 26/07/02.

Meadow Brown, *Maniola jurtina*, Linn, ab. *partimtransformis*, Leeds. (male upperside)
An example of a "bleached" Meadow Brown. This is a pathological variation (not a true aberration), which is frequently met with, although the whitish areas present in this specimen are normally less extensive. B&NES: 29/06/02.

Gatekeeper, *Pyronia tithonus*, Linn, ab. *partimtransformis*, Leeds (female underside)
Ab. *partimtransformis,* occurs in several Browns. The right hand forewing and hindwing underside of this female Gatekeeper display asymmetric blotches. Wiltshire: 18/08/02.

Gatekeeper, *Pyronia tithonus*, Linn, ab. *partimtransformis,*, Leeds (female upperside)
An upperside specimen with paler areas. B&NES: 08/08/02

Ringlet, *Aphantopus hyperantus*, Linn, ab *arete*, Muller (male underside)
Although extreme, it is not uncommon in certain places, 10-15% of a population may be of this form. I have found ab. *caeca* (white pupils on the underside forewings absent) but have yet to see ab. *obsoleta* (a plain brown butterfly). B&NES: 12/07/02.

Interesting moths seen in Devon during 2002 – Roy McCormick

The specimens exhibited were not necessarily the ones seen

964a *Cochylis molliculana* Zell. First recorded at Portland, Dorset by J.R. Langmaid in 1993, and subsequently found at Berry Head by B. Henwood and R.J. Heckford; this specimen one of two taken, at light, at Berry Head, Brixham, 16.8.2002.

1323 *Pediasia contaminella* Hb. Dawlish Warren. Several seen, at light, at this well known spot for this species on 6.8.2002

1325 *Platytes alpinella* Hb. A monitoring trip to Dawlish Warren found the species in good numbers, at light, on 6.8.2002.

1336 *Eudonia pallida* Curt. Dawlish Warren, one of the sites where the species is found commonly; seen at light on 6.8.2002.

1403 *Diasemiopsis ramburialis* Dup. Taken by J. Beswetherick at Crownhill, Plymouth, 20.5.2002, at light; last seen at Plympton, Plymouth, 7.8.1997.

1464 *Gymnancyla canella* D.& S. A trip to Dawlish Warren on 26.8.2002 to see if the species was breeding on the site produced hundreds of larvae; each plant of prickly saltwort was infested with them.

1658 Oak Lutestring *Cymatophorima diluta hartwiegi* Reisser Boro Wood, Ashburton, 11.9.2002, common at light; this was a new site in Devon where the species was the commonest moth of the night.

1694 Smoky Wave *Scopula ternata* Schr. Two Bridges, Princetown, 15.7.2002, one at light, R. Hayward.

1814 Lead-coloured Pug *Eupithecia plumbeolata* Haw. Hembury Woods, Buckfastleigh, 22.6.2002, at light, B. Henwood and B. Bewsher.

1821 Valerian Pug *Eupithecia valerianata* Hb. Great Torrington woodlands, 6.7.2002, two taken at light.

1872 Blomer's Rivulet *Discoloxia blomeri* Curt. Watersmeet, Exmoor, 13.6.2002, one at light, P. Butter.

1885 Clouded Magpie *Abraxas sylvata* Scop. Holcombe, near Teignmouth, 26.7.2002, one at light; it was a great surprise to see this species here, it is usually found in the Lydford area.

1949 Square Spot *Paradarisa consonaria* Hb. Seen at Ashclyst Forest, near Exeter; Burrator Reservoir, near Sheepstor; Hunters Inn, near Heddons Mouth; Kennick Reservoir and Lydford; all occasions at light.

1992 Small Elephant Hawk-moth *Deilephila porcellus* Linn. Seen at Burrator Reservoir, near Sheepstor; Two Bridges, near Princetown and Whistmans wood, Dartmoor; all occasions at light. The species was common at the last site.

2029 Brown-tail *Euproctis chrysorrhoea* Linn. Numbers of larval webs were seen at Dawlish Warren over the winter and adults were taken at light at the same locality.

2031 White Satin Moth *Leucoma salicis* Linn. Countess Wear, Exeter, 25.7.2002, P. Butter, one at light, a female which laid over 100 eggs of which around half hatched, the larvae were distributed to a few people to try and get some through.

2051 Four-spotted Footman *Lithosia quadra* Linn. Hembury Woods, near Buckfastleigh, 27.7.2002, one at light, B. Bewsher.

2076 Kent Black Arches *Meganola albula* D.& S. Seen at the usual locality of Dawlish Warren, 6.8.2002 and Exminster Marshes, 29.6.2002, both occasions at light.

2127 Triple-spotted Clay *Xestia ditrapezium* D.& S. Boro Wood, Ashburton, 3.8.2002, at light; Hembury Woods, near Buckfastleigh, 10.8.2002, at light and Whiddon Down, near Chagford, 18.7.2002, at light.

2133 Six-striped Rustic *Xestia sexstrigata* Haw. Halsdon, near Hatherleigh, 3.8.2002, one, P. Butter and Spreyton, near Bow, 20.8.2002, common.

2231 Deep-brown Dart *Aporophyla lutulenta* D.& S. Countess Wear, Exeter, 27.9.2002, one at light, P. Butter.

2271 Orange Sallow *Xanthia citrago* Linn. Countess Wear, Exeter, 1.10.2002, one at light, P. Butter. A rarely seen species in Devon with only 10 records since the 1980s.

2279 Sycamore *Acronicta aceris* Linn. Exmouth, 20.7.2002, one at light; Woodbury Salterton, 22.7.2002, three or four at light, M. Meehan (one of these shown) and Countess Wear, Exeter, July 2002, one at light, P. Butter. A species that has spread from East Devon where it has been seen seen regularly at West Hill, near Ottery St. Mary.

2301 Bird's Wing *Dypterygia scabriuscula* Linn. Buckland Brewer, near Bideford, July 2002, three or four at light, S. Hatch. Devon has only one other record since the 1980s and that is my Teignmouth specimen in 1996.

2449 Dark Spectacle *Abrostola triplasia* Linn. Halsdon, near Hatherleigh, 3.8.2002, one at light, P. Butter and Teignmouth, 6.8.2002, one at light.

2482 White-line Snout *Schrankia taenialis* Hb. Boro Wood, Ashburton, 3.8.2002, one at light and Cann and Shaugh Wood, Plymouth, 15.7.2002, several at light, P. Butter.

Other interesting species taken or bred in 2002

174 Triangle *Heterogenea asella* D.& S. One male taken, at light, Holland Wood, New Forest, Hampshire, 15.7.2002.

196 *Morophaga choragella* D. & S. Taken on 15.7.2002 at Holland Wood, New Forest, Hampshire.

1292 *Calamotropha paludella* Hubn. Three at light on 15.7.2002, Holland Wood, New Forest, Hampshire.

1345 Brown China-mark *Elophila ny*mpheata Linn. This specimen with brown forewings taken on 15.7.2002, Holland Wood, New Forest, Hampshire.

1675 Dingy Mocha *Cyclophora pendularia* Clerck Bred from a larva beaten from sallow, Winfrith Heath, Dorset, September 2001; the female specimen emerged on 25.5.2002, and a photograph of two of the colour forms of the larvae are shown.

A Homemade Bug Rotator

by Norm Trigoboff

E-mail: tt5544@yahoo.com

I am an amateur naturalist who sometimes looks at insects. I had been taught to stick pinned insects in a cork and hold the cork under the dissecting microscope, but this is frustrating when an insect must be repeatedly repositioned at the same angle after rereading a key, when a brittle specimen grazes a fingertip and crumbles, when the cork blocks the view of the underside of the insect, when finger vibration obscures subtle features, or when you want to show someone something under the scope. Last summer, an entomologist who helped me to identify bees used a bug rotator to position specimens under the scope. The bug rotator, a compact brass and steel device that costs around US$25 (£15), holds a pinned insect in a fixed, yet easily changed position. It solves all the problems with the cork – though you still have to reread the key.

After some trial and error, I made a survivalist-looking bug rotator from a small scrap of cotton cloth, a Pringles(™) container and two old ballpoint pens – the kind with a thermoplastic body tube resembling a thick, un-tapered drinking straw, around 8 to 9mm diameter and 10 to 12cm long. If you want to make your own, you will also need strong scissors, pencil, ruler, candle, matches, a ventilated workplace, and about an hour.

Disassemble the pens, keeping just the outer plastic tubes. Cut a 3cm length from the end of one tube. Hold the tip of the 3cm piece 2 to 3cm above and slightly to the side of the candle flame, while rotating the tube in one direction, until the very tip of the tube fuses and thickens.

Don't reverse direction or let the tube stay still more than an instant, or it will melt unevenly and may burn. Try holding the tube with both hands at one end. Rotate slightly with the left hand, letting the tube slip through the right hand; then rotate with the right hand as the tube slips through the left hand. Continue alternating hands rapidly and smoothly. Practice away from the flame until the tube rotates with a slightly jerky motion. You may want to lick your fingers to keep them cool.

When the tip fuses to about 2mm thick, take the tube from the flame and rotate a pencil in the hot end of the tube to flare the thickened area to very slightly wider than the tube, or at least so the inside of the tube doesn't narrow. Treat the other end of the tube the same. After it cools, roll the cloth into a firm cylinder, push and twist it into the tube, and trim the ends. The cloth will act as a pincushion.

Imagine the remaining 10 to 12cm tube as a standing man; we will bend him so as to sit in a chair. In other words, you will make two right angle bends in the same plane, so the tube will have three parts. The first part (foot to knee) will be 3cm long. The middle part (knee to waist) will be 2cm. The third part (waist to head) will be whatever length is left over. Measure and mark the knee bend. Rotate the mark over the flame evenly, as before. When it starts to soften, bend the tube and hold it at a right angle as it cools. Repeat to form the waist bend. You will have a few seconds to adjust the length of the middle part by pulling or pushing as it cools.

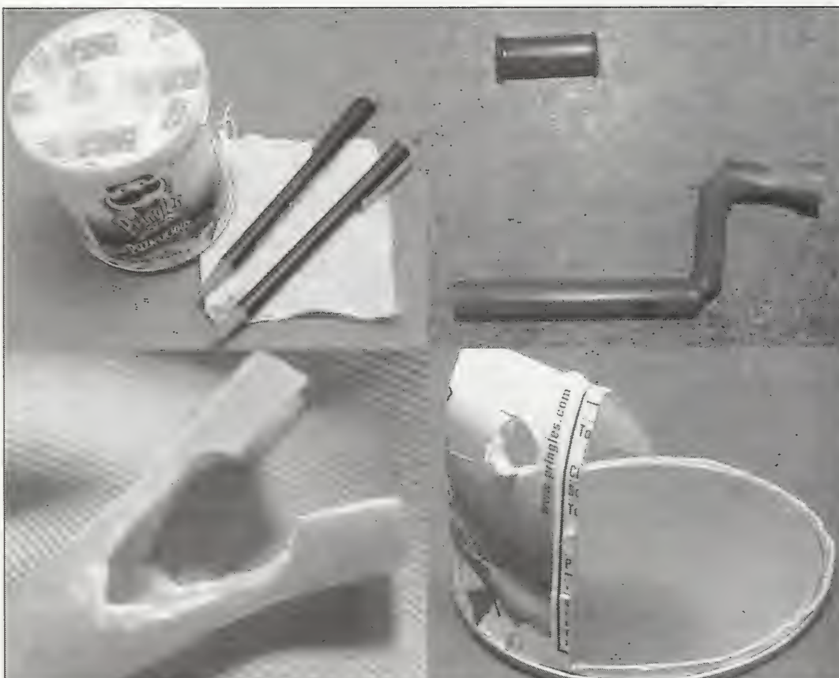


Figure 1. Clockwise from top left.
The Ingredients; The Cloth-Filled Piece & The Sitting Man; The Dog's Mouth; The Base.

Cut the end of the first (short) part sort of like a dog's mouth. Bend it open a bit. It will hold the cloth-filled piece crosswise – the way a dog carries a stick. When snapped into the "dog's mouth," the cloth-filled piece should be free to rotate like a loosely held stick. Try not to imagine the dog's saliva dripping over everything.

To make the base, cut away most of the Pringles container, leaving the metal bottom attached to a vertical strip of cardboard 10cm long and 3.5cm wide. Puncture the cardboard with the pencil 5.5cm from the metal bottom. Enlarge the hole to accommodate the tube. About 1cm above the hole, double the top of the cardboard strip over on itself to form an inverted “V” or “U.” Puncture the other half of the V, so that the third (long) part of the bent tube may be pushed through the two holes in the cardboard and be held horizontally, free to rotate in a full circle. Scrunch the cardboard one way or the other to get the tube perfectly horizontal. You may wiggle the bent tube in the cardboard and widen the dog’s mouth to make the tubes rotate easier. Trim any excess cardboard.

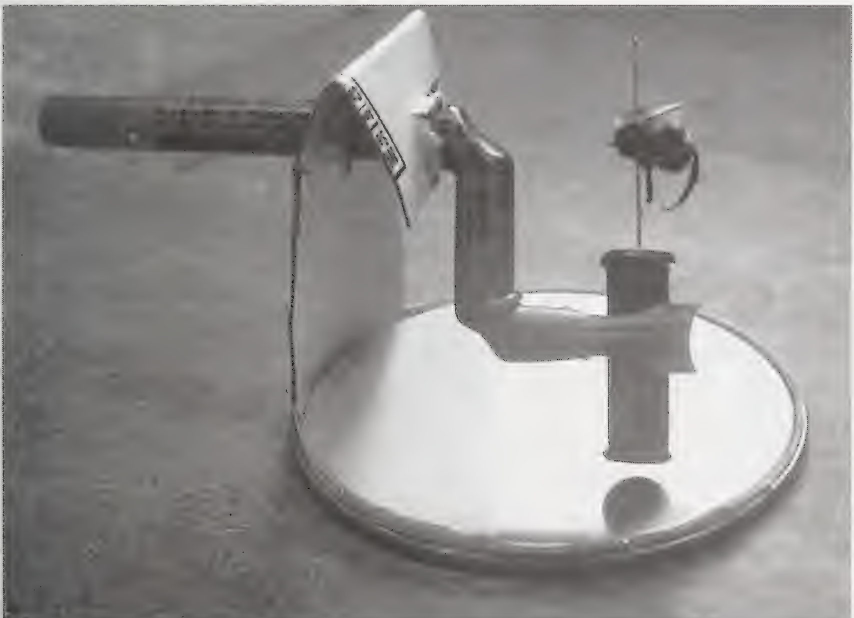


Figure 2. The Bug Rotator.

Take a pinned insect you want to look at and push the pin into the cloth-filled tube, until the insect is in a line with the longest part of the bent tube. When the bent tube and the cloth-filled tube rotate, the insect stays at about the same height, so it stays almost in focus. Position the insect under the scope and use the long part of the bent tube and the end of the cloth-filled tube opposite the insect as handles. You can now view any part of the insect at any angle.

Dragonfly update

by Dr Peter G. Sutton (7388)

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In the previous *Bulletin*, an article describing "The changing fortunes of British Odonata" provided details of a number of species which had the potential to appear on our shores as new migrant species colonists. Sure enough, in the "Wildlife Reports" section of the April edition of *British Wildlife* (Perrin, 2003), the first British record for the **Southern Emerald Damselfly**, *Lestes barbarus*, was documented. This species was found at Winterton dunes in Norfolk, where three male specimens were seen on two separate occasions by Mr Geoff Nobes in late July and early August 2002.

Mr John Luck also kindly provided details of the **Small Red-eyed Damselfly**, *Erythromma viridulum*, which has now appeared in Sussex at Icklesham. This species was recorded from this site on 10th August; and on 19th August, a maximum count of 125 specimens was recorded, including many pairs which appeared to be egg-laying.

In addition to the references provided in the original article, another extremely useful and important piece of work by Stephen Brooks (Brooks, 2001) has come to light, which provides a synopsis of changes in British dragonfly fauna to 1973, followed by a detailed account of changes that occurred between 1973 and 1998. An analysis of the factors affecting change is also provided, together with: details of the Odonata Recording Scheme; an interesting section on "Aliens and introductions" (which includes a list of exotic Odonata imported into Britain with tropical plants); and regarding conservation, some useful information on "National and international policies".

The same publication also contains chapters on changes that have occurred in other invertebrate faunas over the last 25 years, including: "Grasshoppers, crickets and allied insects" by Judith Marshall; "Flies" by Alan Stubbs; "Butterflies and moths" by Richard Fox; "Freshwater invertebrates" by John Wright and Patrick Armitage; and "True bugs, leaf- and planthoppers, and their allies" by Peter Kirby, Alan Stewart and Michael Wilson. However, being unfortunately priced at over £150 per copy, this useful publication is probably best obtained from an appropriate library.

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Perrin, V., (2003), in: Wildlife Reports (Dragonflies), *British Wildlife*, **14** (No. 4), pp. 283-284.

Sutton, P.G., (2003), The changing fortunes of British Odonata, *Bull. Amat. Ent. Soc.*, **62**, (No. 447), pp. 52-72.

Feeding Butterflies and Moths

by Graham Best (7928)

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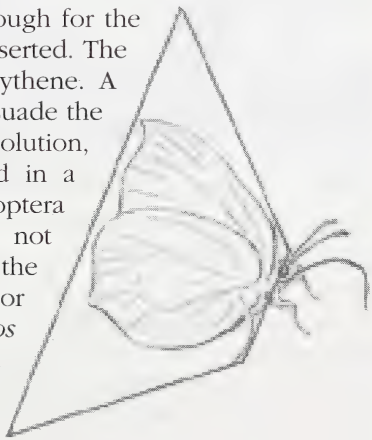
When feeding butterflies and moths with sugar, the advice is to hold them "gently but firmly". Anyone who has tried to hold a butterfly or a squirming, squeaking Death's Head Hawk Moth, *Acherontia atropos*, knows how difficult this can be. Forceps have been advised for butterflies, but I find it easier to cut off the corner of a stiff, clear polythene bag a few inches square. I then cut off the corner of this corner, so it is large enough for the head of the insect to protrude when inserted. The wings are then held through the polythene. A wooden food stick is then used to persuade the proboscis to extend into the feeding solution, which can be conveniently contained in a plastic bottle top. Like locusts, Lepidoptera have an instinct to fly if the legs are not supported. So they may be kept in the envelope, resting on the feeding dish or supported on the stick. With *A. atropos* (which can drink half a teaspoonful at a sitting), I make an ice cream cone shaped funnel and fold it up behind them.



Malagasy Wanderings – Obscure and curious items of entomological literature, part 2

by Richard A. Jones

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Over several years, Brian Gardiner, a previous editor of this journal, published a series of articles on some lesser-known entomological books in his library. He did this in a spirit of clearing up some bibliographical inconsistencies, giving interesting background to several important and historical works. In a similar vein I offer some details of a few obscure and curious books that have found their way into my own library. However, in a departure from Brian Gardiner's theme, the books I offer are not useful key works by important entomologists, they are strange oddities, quaint and off-beat. However, they are all peculiarly entertaining and I treasure them all.

Guide de l'entomologiste a Madagascar, by Charles Alluaud

This strange little 74-page booklet, in paper wrappers, was published in Paris, for the author, in late 1899. At the time, he was the president of the Société Entomologique de France, and I suspect that he was demonstrating his urbane sophistication and erudition when he wrote romantically of his collecting adventures as an "explorateur naturaliste" in such an exotic location.

The booklet is a very general guide to some of the insects he had come across in "la région malgache", then part of the expansive French colonial empire. Beetles were obvious favourites and amongst the 20 pages he devotes to them, he figures several species newly described by himself, together with *Microclaviger alluaudi* and *Parnus alluaudi* named by others in his honour. Other orders only get a brief mention, of half or a whole page.

But it was not his knowledge of the Malagasy fauna that prompted me to buy the book, it was the descriptions of his collecting methods. The first thing that struck me about the book was the curious engraving on the front cover. It showed a rather sketchy portrait of a bare-breasted African woman, bangled and necklaced and with her hair plaited into short knots. She is holding a large rhinoceros beetle, dangling on a thread tied around its prominent thoracic horn.

She is presumably one of the score of African "negrillons" of all ages and sexes that Alluaud used as assistant collectors during his trip.

He explains enthusiastically and at length how he paid them in goods bought on credit from the island's French importers – hats, umbrellas, cosmetics. He then settled all his bills when he returned to Paris.

I suspect that two of the other engraved vignettes in the book are meant to represent Alluaud himself, looking splendid with his jaunty upturned moustache and goatee beard. One shows a booted colonial-looking figure with battered hat and open-necked shirt. Around his waist is a large cartridge belt and he is holding a long rifle. Standing beside him is what I can only presume is one of the younger members of the score of local collectors, an African boy carrying the entomologist's shoulder bag and long-handled insect net. The second picture (figured here) shows the same moustachioed and bearded colonial entomologist at work, booted again, but this time wearing a jacket and smart pith helmet. He is busy using his walking stick to beat branches over an upturned umbrella and in his pocket the top of his killing bottle can just be seen.

Figure 1. *La chasse au parasol.* Colonial time now long passed.

Alluaud obviously enjoyed using this beating tray – he dedicates several pages to "la chasse au parasol" and illustrates some of the more bizarre creatures he encountered including ant-mimic clerid beetles, seed-like tortoise beetles and a splendid leaf bug.

The book begins with the exultation, "Voici venir le xx^{e} Siècle!" – here comes the 20th century, but the book is very much a quaint view of the last decades of the 19th. I snapped it up for the £3.50 price pencilled onto the front wrapper and still giggle when I open it and read.

Hummingbird Hawk moth *Macroglossum stellatarum* Linn. in Wiltshire, 2001

by John Notton (5459)

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For some years past, part of my annual holiday has been spent each August with a group using Sandroyd School in Cranborne Chase as a base. The school has its own formal grounds surrounded on most sides by the type of walled ditch known as a haha. This permits a good unobstructed view of the estate outside without allowing farm animals access to the school grounds. On the south side of the grounds the wall of the haha is bathed in sunshine and many small plants grow in crevices in the brickwork. Amongst these, Lady's bedstraw *Galium verum* Linn. appears to grow luxuriantly – possibly as a perennial – and it is occasionally topped by the horses in the field or by the school mowing machine if it grows above the edge of the ditch.

This year, on the 12th August, I found that several of these plants had larvae of *Macroglossum stellatarum* feeding on them. These ranged in size from tiny larvae, possibly second instar, up to almost full sized specimens, with large and small on the same plants. The total number was estimated to be at least eighteen. I took three of the largest to rear, but with some concern about the absence of the foodplant in my home area at the end of my holiday. Nevertheless, they fed up rapidly, and after changing from the normal green and cream to a more cryptic purplish colour for about 36 hours, they were all three ready to dig into the soil provided. I was able to take them home safely on 19th August. On the day before, I paid a last visit to the haha where only one larva was still visible. However, there was no certainty that others had not been predated. Both the larvae on the plants and those in captivity preferred to eat the flowers and the seed-heads of the foodplant.

The soil the larvae had dug into was contained in a clear plastic box and their cocoons were formed close to the sides, allowing me to watch their development. As I had not seen the early stages of *M. stellatarum* before, I was surprised to see that the pupal case was thin and had transparent areas which allowed a clear view of events inside the pupa. Development proceeded normally and the moths hatched successfully on 10th(1) and 13th(2) September. They were duly released onto a late-flowering buddleia bush in my garden on a sunny day and after a brief refuelling were off at speed to see the world.

In the grounds of Sandroyd School are several choice buddleia bushes of various colours. One particular bush with white flowers has always

been very attractive to butterflies, moths and other insects. On 13th August I watched a *M. stellatarum* nectaring for about 20 minutes – long enough in fact for me to get my camera and to attempt to photograph it hovering. The bright sun allowed me to use 1/500th second exposure at f11 with 200 ASA film. With a zoom telephoto lens the results were reasonable. Even this shutter speed is too slow to completely stop the wing motion, but given that the moth remains within focus for long enough, this does not prevent an aesthetic snap resulting. During the morning of 18th August there was light rain for much of the time although the weather was very mild. I was surprised to see a *M. Stellatarum* nectaring busily at the white buddleia in spite of the rain. In fact it seemed to be actively dodging rain drops!

Even allowing for the very rapid growth potential of this species, finding moths and larvae together in such numbers suggests that quite a few others could have been in the area. Lady's bedstraw is a fairly widespread plant locally, but in spite of careful searching, no other larvae were found. The combination of the warmth and the good plants in the school haha seems to have been a preferred option.

Woodland Graylings – touchy feely

by Matthew Rowlings (9108)

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While driving through open forests in the Alpes Maritimes, southern France in mid-September 2002, I repeatedly disturbed pairs of graylings courting on the road. Eventually I confirmed they were Woodland Graylings (*Hipparchia fagi*). They would stand on the hot road surface facing each other, the male very significantly smaller than the female. I've since read that this is a necessary part of the courtship – the female waves her antenna between his closed wings to make contact with the andriconial scent scales (although these roles may actually be the other way round – my French translation may be suspect. What is certain is that the male has a scent brand). Pairing follows. Unfortunately I disturbed each courting couple by my approach in the car so never got to observe closely what was happening.

Reference

Larfanchis. 2000. *Les Papilions de jour de France, Belgique et Luxembourg et leur chenilles*, Parthenope Collection.

Evidence of hibernation of Red admirals during the winter 2001 to 2002

by M. A. Spencer (10316)

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I am not aware of any previous articles/records of the Red admiral (*Vanessa atalanta* Linn.) hibernating in this country, though to be honest I may have just missed them.

I thought that some of my recent observations of this species might interest some members nonetheless.

Way back in 1983 I found a chrysalis of *atalanta* in late November, which emerged within a few days when brought into the warmth of the house, this one found on nettles in Talbot Woods near Bournemouth.

Since that time, year on year the first Red admirals seem to be seen earlier and earlier (quite often in March/April) and later on in the autumn/winter on into November/December and even January odd individuals would turn up, often feeding on the late blooms of *Hebes*. All of these observations being made in the areas around Poole and Bournemouth where I have lived for the past twenty years.

This last winter however is the first time I have ever witnessed Red admirals sitting in an apparent hibernation position, and that was of a pair (two that is, not necessarily both sexes) sitting close together under the corner of guttering on a bungalow roof on 20th December 2001.

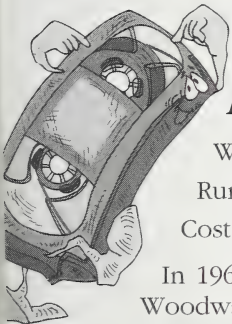
Unfortunately I was not able to be at this address again until the 8th January 2002, owing to the Christmas holidays but I was pleased to see that one of the butterflies was still sitting in almost exactly the same position. I know that we have been getting progressively milder winters in recent years, the winter of 2000 to 2001 was almost completely frost free in the Bournemouth area, but this last winter has been almost "normal" by comparison. We have had a number of sharp frosts and terrible wet and windy days, so these butterflies had been through quite a rough ride!

Another individual was seen at the same address on 29th January, this time half asleep inside a large *Eleagnus* shrub. It appeared weak and sleepy but opened its wings to sunbathe a little in the weak sun on what was a very cold and windy day.

Yet another Red admiral was seen actively flying on 5th February 2002, this time nearer to Bournemouth town centre on Glenferness Avenue. Odd individuals were also seen at Parley and Wimborne and in my own garden (at Branksome) during January/February but I neglected to record the exact dates.

I would be interested to know of other observations on this species, especially from other, colder(!) more northerly parts of the country.

At what point I wonder can we change the status of the Red admiral from a British migrant to a resident species? Or is this just a flash in the Global Warming Pan?



"The Alder Woodwasp and its Insect Enemies"

World Education Films Ltd

Running time: 25 minutes

Cost: £35.00

In 1961 the BCC's "Look" programme first aired "The Alder Woodwasp and its Insect Enemies", this short film and its maker Gerald Thompson, were to change the future of insect filming, being a pioneering example of macro-cinematography. World Educational Films have now digitally enhanced this work and have released for general sale.

The film follows the behaviour and biology of the alder woodwasp (*Xiphydria camelus*, Hymenoptera: Xiphydriidae) and four of its parasitoids; *Aulacus striatus* (Hymenoptera: Aulacidae); *Rhyssella curvipes* (= *approximator*); *Pseudorhyssa alpestris* (Hymenoptera: Ichneumonidae); *Xiphydriophaga meyerinckii* (Hymenoptera: Pteromalidae). The macro-shots are amazing, the behaviour they show interesting, and it is no wonder that in its day this film was used as an educational tool, I can't imagine anyone interested in insects in anyway, shape or form, not being impressed by this footage.

Unfortunately the film is rather dated, which does detract from its overall impact, the commentary, though clear and exact is a little monotonous, and the constant background noise of a twittering bird extremely irritating. Although this film will not be viewed widely, being a rather specialised subject matter, I can thoroughly recommend it, if for nothing else, some of the best behavioural entomology on film!

This and other titles ("Tiger Beetle - A Life History"; "Spiders - Mating"; "Spiders - Prey Capture"), are available from World Education Films Ltd, "Ox-Close" Main Road, Long Hanborough, Witney, Oxon, OX29 8LD. http://www.worldeducationalfilms.com

Ladybird Colour Patterns

by Paul Tinsley-Marshall (12260)

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Ladybirds (Coleoptera: family Coccinellidae) are characterized by surface colour patterns, particularly on the elytra, which, as well as showing inter-species variation, also show intra-species variation. This phenomenon has been the subject of a great deal of study. This paper brings together the findings of much of this research.

Patterns on the elytra consist of darker spot shapes on a lighter background of brown, red, yellow or white. The pigment that makes up the dark spot pattern is melanin, while the light pigments contain alpha- and beta-carotene, and lycopene, all derived from carotenoids.

The pattern is made up from basic units or spots, which are positioned in precise locations on the elytra. Various different patterns occur characterized by the number of spots and the composition of connections between them, making for strongly discontinuous variation of pattern. Due to sexual dimorphism, both sexes should be treated separately when classifying variations in colour patterns. The proportion of particular deviations has been found to vary statistically between both sexes.

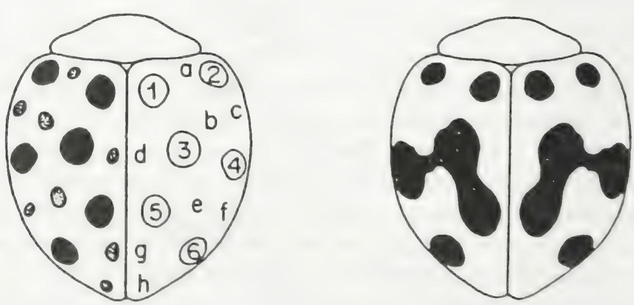

Figure 1. Diagram showing basic spot units of *Epilachna*. From Abbas *et al* 1988.

Left: Standard elytral spot pattern of *Epilachna*, showing codes for persisent (1-6) and non-persistent (a-h) spots according to Dieke (1947).

Right: The confluence of spots, exemplified by 4=3=5.

Classification of variability can be carried out in one of several different ways:

1) In relation to the amount of pigmentation of the elytra as a proportion of the total area covered by the dark melanic design.

2) Different morphs are placed in 'eunomic sequence' and are each defined by the developmental sequence of one character, eg: an increase in the number of spots or the number of fusions betweenspots. Each sequence of morphs forms a separate 'lineage' and is dissimilar to the others. Individuals that are different from each other by a change in character of one unit, such as one spot or one fusion, are placed adjacent to each other in the 'eunomic sequence'.
3) The advantageous characteristics of both methods described above are combined in Schilder's technique 'Variationsbild', which arranges variation in two dimensions The beetles are classified by the degree of melanisation, as in method 1, and arranged into a horizontal series, and also by the sequential development of characters, arranged in vertical lines (eunomic as in 2). (Schilder and Schilder 1951-2, Schilder 1952-3 not listed). Diagram from Hodek 1973.

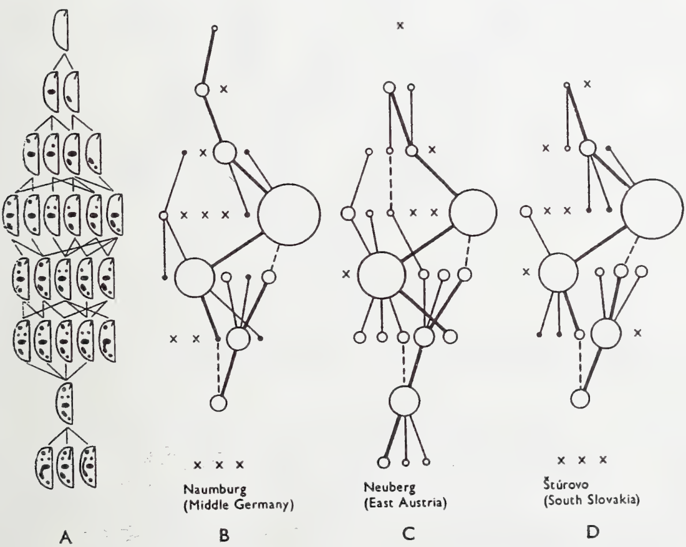

Figure 2. Classification of variability in *Adonia variegata*. A – Schilder's "Variationsbild". B-D – Frequency of aberrations (indicated by diameters of circles) in three localities (Schilder 1951-2).

4) The last method is similar to classical taxonomic methods – the most basic pattern of a species is used as a starting point from which other species patterns can be resembled, either by eliminating, adding or fusing spots. The basic pattern of a genus can be determined by comparison of the basic patterns within the genus (Johnson 1910 not listed).

Figure 3. Classification of variability (mode 4) in *Hippodamia convergens* (Johnson 1910).

The role of the distinct colour pattern that characterizes ladybird beetles is to provide defence from predation by aposematism. The colouring provides a conspicuous warning to potential predators that the beetle has a noxious taste, caused by reflex bleeding of the haemolymph from the femoro-tibial leg joints when attacked (Gullan and Cranston 2000). However, this is not the only reason that coccinellids have been intensively studied.

The development of colour in ladybirds has been linked to environmental conditions (Grill 1999) including diet and temperature. The diet of an adult beetle can greatly influence the development of colour over time, as studied in the aposematic ladybird *Harmonia axyridis*. A high quality aphid diet produces a strong and bright red colour. Feeding *H. axyridis* larva a lesser quality pollen diet causes them

considerable disadvantages in terms of development time, overall size and adult colour, resulting in a paler adult pigment. This would appear to suggest that colouration is influenced by a component of the diet which acts as a limiting factor. Grill also suggests that the energy a beetle needs to expend to produce bright pigmentation is not provided in sufficient amounts by the lesser quality pollen diet. Poorly coloured beetles may be at a disadvantage in terms of defence, as predators which have learnt to associate the warning colouration with the noxious taste caused by reflex bleeding may see paler individuals as less well defended and therefore a more desirable food item. Grill (1999) also suggests that chemical defence-reflex bleeding in ladybirds may cause a reduction in brightness of the adult *H. axyridis* but found there to be no link.

The theory of thermal melanism is perhaps the most studied aspect of coccinellid colouration. The theory suggests that when melanics (the black morphs of species) are dominant to non-melanics (red) they have gained a selective advantage due to the higher absorptive nature of black pigments over red (Brakefield 1984b). Brakefield found that in both Britain and the Netherlands there is a negative correlation between the hours of bright sunshine and the frequency of melanic morphs of *Adalia bipunctata* (Brakefield 1984a), providing evidence for the theory that melanics gain a greater selective advantage in lower sunshine conditions due to the efficiency in absorption of solar radiation.

Brakefield 1984a provides several points that confirm the theory. Firstly, that melanics tend to disperse from shrubs to nearby trees – an aspect of their behaviour – earlier in the year than non-melanics. They where also found to mate, oviposit and die earlier than non-melanics. The melanic polymorphism may be influenced in populations by selective predation, although Brakefield found no evidence for this, and maintained by the differential timing between the two morphs of adult eclosion – emergence from the cuticle of the previous instar. Experimental data sited by Brakefield show that melanic *Adalia bipunctata* are more active and achieve greater body temperatures than non-melanics.

Brakefield found evidence of selection along clines, with melanics being favoured in terms of earlier reproduction further inland, where spring temperatures reach a mean daily level of >10°C, 10 days earlier inland than at coastal sites.

The basis of thermal melanism in *Adalia bipuntata* was confirmed in 1984 (Brakefield and Willmer 1984) by the demonstration that melanics have a lower level of reflectance from the cuticle, and can reach higher

body temperatures at faster rates of change under experimental illumination conditions than non-melanics. Under illumination similar to bright sunlight melanics gained a 2.1∞c larger temperature excess (t . ex) over ambient air than non melanics, with temperature change rates initially 50% faster for melanics (Brakefield and Willmer 1984).

Later work (De Jong Iet al 1996) looked at the effects of the transition of radiation through the elytra, body size, width of sub-elytral cavity, ambient temperature, radiation intensity and wind speed. By measuring walking speeds the results gained where consistent with the differences in body temperature of the two morphs.

Variations in the colour patterns of ladybirds have been found to occur geographically as well as inter- and intra-species. In some cases this has been found to be directly related to thermal melanism (Brakefield 1984a). The frequencies of melanics in the Netherlands are 1-15% in the northwest and >50% inland in the southeast. These relate to negative correlations with index of oceanity, relative humidity and length of sunshine.

Variation of elytra spot patterning has also been documented in the province of Sumatra Barat, Indonesia (Abbas, *et al* 1988). The phytophagous ladybird *Epilachna vigintioctopunctata*, previously recognized as two forms (formae A and B Katakura *et al* 1988 not listed) are now thought to represent an intraspecific variation instead of two related species. The populations of *E. vigintoctpuntata* where divided in four major groups by the occurrence of differing elytral spot patterns. Groups 1 and 4 represented the two extremes of patterning, and where connected to one another by groups 1 and 2. The elevation of the sample sites was positively correlated to the average number of non-persistent spots per elytron. This may be a factor relating to thermal melanism, although is unconfirmed at present.

Variations in elytral spot patterning also occur seasonally. For example, *Harmonia axyridis* populations have been found to contain increasingly greater proportions of melanics from spring to summer due to the greater occurrence of mating of morphs in the spring generation (Osawa and Nishida 1992). Laboratory experiments showed that both the melanic and non-melanic female morphs chose non-melanic males in preference in the spring, and that non-melanics had reduced success in the summer. This causes the frequencies of melanics and non-melanics to vary between the seasons, with an increasing proportion of non-melanics towards the summer and then decreasing as the season progresses.

A mating advantage of non-melanic males has been shown to help maintain polymorphism between melanics and typical forms of *Adalia bipunctata* in U.K. populations. Genetic female preferences in mating cause excess in melanic male matings over the typical form (Tomlinson 1995). Both environmental factors and female mating preference were thought to be responsible for the maintenance of high melanic frequency in U.K. populations, notably in one population in Aberdare, South Wales. However in the study by Tomlinson, no evidence was found for a mating advantage to melanic males, leaving the complete cause of this high melanic frequency unexplained for this population. In contrast, a mating advantage for melanics was found to be in operation in populations in the Netherlands (Brakefield 1984c). Frequency data analysis for the offspring of mating populations shows that the mating advantage gained by melanics is mirrored in the increased melanic frequency of the preceding adult generation. The data presented by Brakefield back up the theory by Lusis (1961 not listed) that the greater frequency of melanic mating is directly related to the effects of thermal melanism.

Along with colour, body size has also been shown to influence mating success. Larger males in non-melanic populations have a greater advantage, while in melanic populations there was not a notable difference between sizes (Ueno *et al* 1998). Non-melanic mating males where much larger than solitary individuals, with no particular difference for melanic males in populations of *Harmonia axyridis*. In this species colour polymorphism is controlled by 11 alleles at one locus (Scali and Masetti 1984), therefore these alleles have a great effect on mating success, while also being under the influence of body size for non-melanics.

In Italy, populations vary in proportion of the three common morphs, *typica* (reds), and the melanics *sexpustulata* and *quadrimaculata* (Scali and Masetti 1984). Annual mean temperature accounts for total melanic frequencies, but there are considerably different proportions of the morphs, even in close proximity of habitat. This suggests that local selective agents are important in the adaptive qualities of the two morphs.

The implications of colour polymorphism on sperm competition are examined by De Jong, *et al* (1993) in *Adalia bipunctata*. Females having first mated with a typical male and then a melanic form two distinct groups in relation to sperm precedence. Either the typical female continues to lay eggs that have been fertilized by the typical male, or after mating starts to lay eggs fertilized by the melanic male only. The

results gained by De Jong *et al* show that *A. bipunctata* shows nearly complete dominance of last male sperm fertilization, although the mechanism by which this occurs is unknown. Under conditions of thermal melanism the melanic morphs may gain a selective advantage over the typical under low levels of solar radiation. This is dependent on the presence of food at the same time to ensure egg viability. The synchronization of food availability and the activity of the insects is even more important if complete sperm precedence is in operation. Any advantage that may be used by melanics is lost or reduced if eggs can be laid only at the time typical males become active, as it would become increasingly possible for typical males to displace melanics sperm on insemination.

The occurrence of melanic forms of ladybirds is frequent in smaller species of the coccinellid beetles such as *Adalia bipunctata*, but in larger species such as *C. septempunctata* it is rare or totally absent. It is suggested that large species do not have melanic morphs because the temperature excess which is a function of the black colouring of the elytral surface would cause the frequent occurrence of deleterious body temperatures on hot days (Stewart and Dixon 1989). Temperatures excesses of 10°C may lead to heat stress on sunny days. A two-spot lady bird with completely black elytra of an area of 20mm^2 under the conditions studied by Stewart and Dixon would have a temperature excess of 4.1°C, while a large entirely black ladybird with an elytral area of 60mm2 may have a temperature excess of up to 19.5°C. Sethi and Atwal (1964 not listed) have shown that temperatures above 20°C can cause a significant decrease in longevity and fecundity of this species. At over 35°C the dramatic reduction causes a life span of 14.5% and egg laying of 10% of levels at 20°C. Therefore large melanic ladybirds would be in danger of reaching detrimental body temperatures on sunny days.

There has been found to be significant variation in spot pattern in terms of the size of spots in relation to the length of the elytron in populations of wild *Adalia bipunctata* (Holloway *et al* 1995). On both the elytra and pronotum, individual colour patterns where found to have high estimates of heritability by quantitative genetic analysis. The pattern of co-variances between the elytral and pronotal spot patterns may be attributed to an optimum rate of melanin production, so as to maximize the effect of deterring predators by use of the aposematic colour pattern. Co-variances between the elytral spot of the two spot ladybird and the pronotal spots were on the whole all negative, and positive between the pronotal spots. If an optimum system of melanin production were place, it would also explain the high rate of additive genetic variation present

in each of the pattern features observed. Sex linked gene expression was not found to affect colour pattern although Holloway *et al* (1995) suggest that female colour pattern may be linked to maternal inheritance. The factors that affect the evolution of the aposematic colouration can be determined by this type of genetic analysis. It is likely that the visual predators of coccinellidae (vertebrates) have had a greater effect on the development of colour pattern than non-visual predators (invertebrates). How these predators select on the colours is less obvious. It may be only colour, the layout of the colours, or the shape and size of the features, which make up the colour pattern. The variation in colour patterns found at different sites in this study suggests that localized environmental conditions act to favour different spot sizes, rather than selection by predators.

Ladybirds have a complicated pattern of elytral colouring. Although it has only a single main function (aposematism) patterning affects the behaviour and ecology of these insects in many ways. More work is needed to determine the exact level of effect of thermal melanism, mating advantages, and sperm competition, and to map the occurrence of all morphs worldwide, to provide a greater understanding of this subject.

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Samos and Patmos June, 2002

by Matthew Rowlings (9108)

29 Woodpath, Southsea, Portsmouth, Hampshire, PO5 3DX.

Samos is a beautiful Greek island just one or two km from Turkey. In fact it swapped ownership between these two countries a few times during the 20th century. It has two large mountains, both of which we explored for butterflies in early June. We had excellent weather, an excellent hotel and for the first time we hired a small 4x4 to get us about. The latter was a luxury that we didn't find real value for money. The island can be reached by charter holiday from June onwards and car hire is fairly cheap locally (we booked from home).

Butterfly-wise we found little lacking. For the first time ever, I found everything I wanted on a trip to a foreign location. The species in question were Orange Banded Hairstreak (*Satyrium ledereri*) (only found here on European territory), Eastern Brown Argus (*Kretania eurypilus*) (found only here and the Taygetos Mts. in S Greece), Levantine Skipper (*Thymelicus hyrax*), *Maniola telmessia* (a Meadow

Brown), Inky Skipper (*Erynnis marloyi*) and *Hipparchia mersina* (a Grayling). All these were found on the higher, and very difficult to access, Mt. Kerketeas in the west. This mountain required a very early start at about 400m altitude then a good two or three hour hike up some rather precipitous slopes. Take plenty of water and start very, very early to avoid the heat of the day. Mt Karvounis offered car access but the year 2000 fires that had destroyed all the forest to the south of this mountain had certainly damaged the flora and, as a consequence, the fauna. Therefore we failed to find either the Orange Banded Hairstreak or the Eastern Brown Argus although both are reported from here. In addition, we managed the common Southern Swallowtails (*Papilio alexanor*) and White Banded Graylings (*Pseudochazara anthelea*). We even managed a Queen of Spain Fritillary (*Issoria lathonia*), to my knowledge a rare insect on the Greek Islands, and not recorded by Olivier 1993 or Tolman 1997.

We took a day trip to Patmos, a one hour journey by Blue Dolphin hydrofoil. A tiny island with an idyllic main town, Skala, and bay overlooked from a castle at Chios, some 200m above it. This is the perfect holiday brochure image of a Greek Island. Olivier records seven species from here, including the Loew's Blue (*Plebejus loewii*). I found six of these but no Loew's Blue, my target species. I also found a further seven species so I was quite surprised and pleased by our day out. Two of these species I didn't find on Samos – Pigmy Skipper (*Gegenes pumilio*) and Lesser Fiery Copper (*Thersamonia thersamon*), the latter being rather widespread. The Pigmy Skipper was in a typical location for this species. It was patrolling an extremely hot dry rocky stream-bed at low level and close to the sea. It was extremely alert, making it very hard to approach and catch. Luckily it was highly territorial so returned repeatedly to a small area of rocks. A word of warning – the hydrofoil service is subject to disruption – we were forced to wait five hours for our return trip, only to have it cancelled until the morning. Luckily we didn't have a flight the in the morning! Next day we managed to catch the first ten minutes of the England-Nigeria football world cup game and luckily missed the rest of the lack-lustre performance while admiring the views of the Samos, Patmos and Ikaria amongst other islands and the small flocks of Cory's and Mediterranean Shearwaters.

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Book Review

The Butterflies of Colchester and North East Essex

by Ted Benton and Joe Firmin. Published by the Colchester Natural History Society 2002, 120pp., 12 colour plates, three black and white figures (ISBN 0-9516312-1-7) £9.99 pbk.

The title suggests a book of very limited appeal! Do not be deceived, however, as this is an interesting and useful book, not just for those living in Colchester. It is a nice review of butterflies of East Anglia looking at their recent history, trends and future.

The general layout is logical and neat. A general introduction to butterflies is followed by the species accounts. These are divided into resident species, migrant species and "the lost ones". It is sad to comment that the latter includes 14 species! After the colour plates are chapters on where to watch butterflies (including an historical perspective) and Colchester butterfly hunters of old. The book is thoroughly researched. The species descriptions are authoritative. In fact, they are so well-written, I would like to see a general butterfly book by these authors.

The whole tone of the book seems to be a lament for lost beauty. However, there is also a hint of hope that suitable management may be in place in sites to retain and possibly even enhance the present fauna.

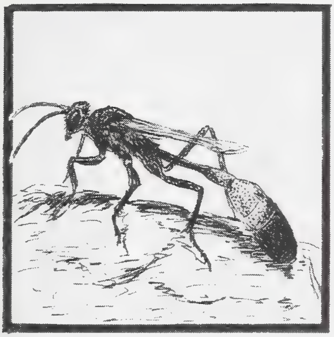
I feel that the one thing that the book lacks is a map of the area covered. This would increase its usefulness to those not as well-versed in the locality as the authors.

The colour plates are well-taken photographs, but sadly they have not been reproduced particularly well. This reduces their utility, but when used in conjunction with the text, they could still be used for identification.

Overall this is an excellent book that all those who live or have lived near Colchester should buy. In fact, if you have an interest in butterflies of East Anglia you should purchase a copy.

To order a copy of this book, send a cheque payable to Colchester Natural History Society for £11.49 (£9.99 + £1.50 p&p) to: CNHS, 41 Oaks Drive, Colchester CO3 3PS.

Phil Wilkins (7607)



ANNOUNCEMENTS, REQUESTS AND REPLIES

Amendment to the Constitution

Following the Special General Meeting which took place on 26th April 2003, notice is hereby given that clause 7(ii) of the constitution of the society was duly amended. As a result, clause 7(ii) will now read as follows:-

"The Council shall now comply with their obligations under The Charities Act 1993 (or any re-enactment or modification of that Act) with regard to the preparation of an annual return and its transmission to the Charity Commission. In addition, a copy of the accounts and balance sheet shall be sent to each member in or with The Bulletin each year."

Peter May, Hon. Treasurer

Request for an experienced marketer

As mentioned in the Editorial, the Society is keen to raise its profile and recruit more members. This should increase the Society's funds, so that a better service can be offered to all. The Council has many ideas, but we would value the help of any members who are experienced in marketing. Is there anyone who feels they may be willing to help? If anyone is willing to promote the Society in their local area, this would also be a great bonus, as would suggestions for enhancing publicity.

Annual Wrappers for the *Bulletin*

Some years ago, the Society produced "wrappers". These were used to help keep a year's worth of *Bulletins* in order on the shelf. Recently,

there have been requests to re-introduce these. The likelihood is that they would be of sturdy card and attractively presented. Prices would be in the region of £4 for a pack of 10. Before the Society takes on the expense of printing these wrappers, we would like to gauge the potential market. We would therefore be grateful if members could contact the Society (PO Box or email) to register interest.

Paul Talbot's Cranefly

Paul has contacted the Society to say that the exuviae from the dead log in his garden in Calderdale, Yorkshire (mentioned in his article Talbot, P. and Warren, S. (2002)) has been identified. In his words – "the 'mystery' exuvia we found poking out the log have been confirmed now as *Tipula (Dendrotipula) flavolineata.*

T. flavinoleata emerging from pupal case (early morning) Photo: Paul Talbot

"I had only the sixth post-1980 Yorkshire record of the above species in my garden here in Calderdale last year, when I found a female of *flavolineata* ovipositing in a log. The species was determined by Roy Crossley a Yorkshire Dipterist who specialises in the Tipulids. We also had many pupal skins of this species extruded from the log in question which is in a rather shady part of my tiny garden.

Close-up of *flavinoleata* pupal case. Photo: Paul Talbot

"I noticed yesterday the there appeared to have been a large emergence of this species once again but this time most pupal skins were from another log in the garden which is in bright sunshine (assuming we have some!) most of the day. The log in question is the one I drilled with lots of holes to encourage bees and wasps to nest in it."

Reference

Talbot, P and Warren, S (2002) Gardening for Insects. Dead Wood in the Garden. *The Bulletin of the Amateur Entomologists' Society*. **61** (445) pp 234-238.

Request for insect surveying in South west France – c16 acres of hillsides – half grassland, half (sessile oak) woodland and 45m² pond

Jenny Boncey has contacted the AES to ask for help. This is a farmhouse restoration project, now with modern plumbing. Most of the land has never been intensively farmed, which gives an opportunity to study many diverse species. There is a small new guest building (sleeps two) with own kitchenette and bathroomette. We are an hour from Toulouse, to the north west.

Last year we started the butterfly (and moth) audit (41 butterfly species so far, latest moth result due soon). There are also praying mantis,

dragonflies, spiders, bumble bees, other bees, wasps, hornets, glow worms etc. Plus toads, frogs, newts, salamanders, snakes etc. We are looking for one or two AES members who might like to spend a week here, self-contained accommodation free of charge, investigating whichever insect-group(s) they like. We would like a copy of their observations at the end of their stay. They should be prepared to pay their own trip costs, plus meals while here. Foodplant experts also welcome!

This is an area important for growing garlic, and is under the bird migration route through the Pyrenees (which are two hours away). Please contact Jenny directly:

Jenny Boncey, Barrau, Haumont, F-82500 Esparsac.
Tel 00 33 65 63 26 12 72
Boncey@wanadoo.fr

Any reports would also make interesting reading in the *Bulletin*!

Early Butterflies

Painted Lady, *Cynthia* cardui on Wisteria, 31st May 2003. Photo: Anthony Darby

There is often much debate about how early butterflies emerge from hibernation. The *Bulletin* received the following note early this year, which we have been unable to publish until now:

Monday 26th January 2003 was exceptionally warm and sunny here in Partridge Green, Sussex and I was amazed to see a Small Tortoiseshell, *Aglais urticae*, flying in my garden. It eventually settled to sun itself on the bare earth. This is the earliest I have seen this butterfly. *Dave Wells (6829).*

We would be delighted to receive January 2004 records of any butterfly species, to publish a summary in the February *Bulletin*. Please send records to the PO Box, or via e-mail.

On the subject of early butterflies, Anthony Darby writes from Dunblane in Scotland. The photograph shows a Painted Lady, *Cynthia* cardui, seen on 31st May (along with an Orange-tip, *Anthocharis cardamines*). Anthony cannot remember seeing a Painted Lady in Dunblane in May before. 2003 has broken all his records for peacocks too. In 27 years in Dunblane he had only ever seen two spring peacocks. He has seen over a dozen this year, plus several in other parts of Central Scotland. Only in the last half dozen years or so have they been present at all in the autumn, now far outnumbering tortoiseshells, which still appear in their usual numbers.

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The Amateur Entomologists' Society

Founded in 1935

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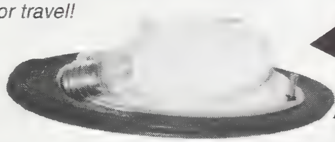

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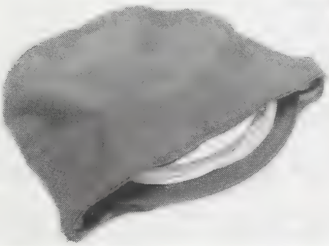

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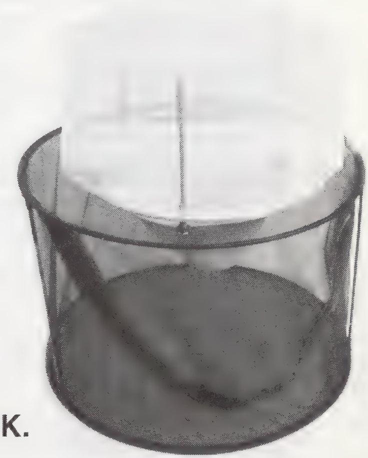

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Photo: Peter Sutton

The cover of the *Bulletin* shows a male Scarce Chaser, *Libellula fulva* basking in sunlight. This specimen was found at New Bridge near Billingshurst in West Sussex on the thin strip of land that separates the Wey and Arun Canal, and the River Arun. The Scarce Chaser, as its name implies, has always been a rarity in Britain and is confined to a handful of river systems and nearby still-water sites in southern and eastern England. Recent evidence suggests that it is beginning to expand its range, notably appearing for the first time in Surrey in 1996 and resurfacing in Kent after decades of absence.

The Bulletin
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Editorial

This issue of the *Bulletin* contains a good mix of articles, from the delights of Greek Lepidoptera and a tale of Bolivian adventure, to the third in the series of articles on "Classic Entomological Sites" which will hopefully whet the appetite of those who enjoy the rich entomological fauna of southern coastal sites.

We have enjoyed a taste of the Mediterranean climate ourselves over the last month or so, and it was strange to be in the Lake District (where I was lucky enough to find a few end of season High Brown Fritillaries in their last UK stronghold), in torrential rain, as London broke the 100 degrees Fahrenheit barrier to register the hottest temperature since records began. It has been an extraordinary summer of flash floods and drought, and tales of great plagues of flies preventing people from opening their windows and doors in the sweltering heat. And in the heat of it all, there have been those who have set off with camera, hat and sun-block, and continued to record and enjoy their observations regardless of the often blistering conditions. We look forward to seeing some of those recollections in due course, and I would like to take this opportunity to sincerely thank those members who have submitted their articles for public consumption! Thank you.

We look forward to seeing you at the AES Annual Exhibition at Kempton Park on Saturday the 4th of October.

Peter Sutton

The AES Annual General Meeting and Members' Day, (26th April 2003)

by Dr Peter G. Sutton (7388)

AES Habitat Conservation Officer, 2 Fir Tree Close, Flitwick, Beds. MK45 1NZ.

For the second year running, the AES Annual General Meeting and Member's Day was held at the London Zoo meeting rooms in Regent's Park, London. After the glorious weather that graced last year's AGM, this April was tending to be unseasonably cool and members were glad to get into the meeting rooms for hot tea and coffee, accompanied by a plentiful supply of cakes and biscuits.

The day began with a minor technical hitch, which allowed Council to address the serious element of the day and begin the AGM early. The meeting, which included an additional and pre-announced Special General Meeting, also revealed the winners of our two prizes. The Hammond Award for the best *Bulletin* article was won by **Ian Wallace** for his excellent illustrated article, ***The Beginner's Guide to Caddis (Order: Trichoptera)***; and the Ansorge Award for the best (AES Annual Exhibition) exhibit by a junior member was won by **Natalie Lawrence** for her superbly detailed account, ***Insects of South Africa***, which documented a wide range of species encountered in Cape Town and the Medique Game Park.

Dr David Lonsdale was welcomed as the new President of the Society, taking over from **Wayne Jarvis**. Council thanked Wayne Jarvis (who is currently organising the AES Annual Exhibition) for his outstanding contribution to the AES. In addition to taking on a vast workload on behalf of the AES in a variety of different roles over the last decade (President, Secretary, Bulletin Editor, Exhibition Secretary), Wayne Jarvis also firmly established the new format of the *Bulletin*, bringing it unequivocally into the modern era. Council also sincerely thanked **Tony Pickles**, for his many years of service providing sound financial advice as the auditor of the Society's accounts.

After the meeting had been completed, our first speaker, **Dr Alex Ramsay**, introduced the audience to ***"The beetles of Scotland: Evolution of a modern Scottish fauna"***. The lecture began with a description of the characteristic beetle fauna of pioneer species such as Aspen and Hazel, and described how the coleopteran fauna of Scotland had developed in response to the changing nature of its climate and habitats. By way of example, Alex described how the arrival of Pine in Scotland introduced a new assemblage of species, including distinctly

Scottish species such as the cerambycid rarity, *Judolia sexmaculata*, which is now almost entirely confined to the eastern Highlands of Scotland. The historical and modern distribution of species was discussed and a description of the fauna found during the very warm period between 900 and 1200 AD, was followed by an explanation of why many of these species, such as *Malachius aeneus*, disappeared from Scotland as the climate changed from "Mediterranean" to "Oceanic" in character. The lecture was well-illustrated throughout with high quality pictures of species such as the Northern Cockchafer, *Melolontha hippocastani*, Northern Rose Chafer, *Potosia cuprea*, and the Birch specialists, *Schizotus pectinicornis* (a Cardinal Beetle) and Bee Beetle, *Trichius fasciatus*. Alex also described the reasons for the disappearance of *Platycerus caraboides* and *Lamia textor*, the difficulty of finding adults of the impressive *Saperda carcharias* in spite of the presence of the large characteristic exit holes that it leaves in Poplars, and the modern distribution of upland and montane species.

Lunch was taken at 12.30 and gave members a chance to take advantage of the free entry into London Zoo. As with last year, members of the Bug Club thoroughly enjoyed themselves, and had their own agenda for the day which included a guided tour around the "Bug Zone", which housed a variety of Tarantula's and Scorpions, and many insects including some huge Bush-crickets and Stick Insects.

After lunch, **Phil Sterling** described ***"The Moths of Portland, Dorset"***. Phil introduced the Isle of Portland in terms of its climate and habitat. This included a description of how the nature of many of these habitats had been shaped by the activities of man, which in some cases, such as the abandonment of limestone quarries, has been to the benefit of wildlife. Some of the great Portland rarities were described, including: *Eudarcia richardsoni*, an RDB1 micromoth whose known world distribution is centred on Portland and one other colony (still present after its original discovery in 1888) at Swanage; and the Portland Ribbon Wave, *Idaea degeneraria*, which is found on undercliff habitat on Portland. Phil described his search for another species, a Leaf-Miner, *Scythris siccella*, which was originally discovered by the Rev. Digby on Ham Beach in the 19th century. In spite of the sole UK site for this species being the 150 metres or so of Chesil Beach that links Portland to the mainland, it still took Phil three years to locate this highly elusive species! Many other species were described, from a range of habitats that occur on Portland, and Phil stressed the need to maintain the diversity of these habitats in order to preserve Portland's biodiversity. The unexplained disappearance of species such as the Bordered Gothic,

Heliophobus reticulata, and the Dotted Rustic, *Rhyacia simulans*, from Portland was discussed, but it was revealed that there are more species arriving than being lost, including potential new UK colonists such as the Great Dart, *Agrotis crassa*. The activities of the Portland Bird Observatory and its important role in monitoring the migration of both birds and insects, including great rarities such as Radford's Flame Shoulder, *Ochropleura leucogaster*, and the Purple Marbled, *Eublemma ostrina*, were also discussed.

In a change from the usual focus on entomology, the final talk of the day, ***"The Four Seasons, an account of the changing flora and fauna through the year"***, was provided by professional wildlife photographer, **George McCarthy**. George, who is one of Britain's foremost natural history photographers, has won many accolades during his career, and his work has appeared regularly in books, journals and newspapers across the world, from *BBC Wildlife* and the front page of *The Times*, to the *South China Post*. As expected, the crystal clear images and choice of subject material were testimony not only to a photographer of great technical ability, but also one who puts a great deal of thought and imagination into portraying the natural world at its most evocative. It is clear that the talent George has for unlocking the secrets of plants and animals comes from a sound knowledge of their habits and life-histories. The entomological aspect of the talk focused primarily on Lepidoptera, and included some remarkable pictures of Silver-washed Fritillaries, showing various aspects of their lifecycle and behaviour, including a female laying eggs in the root hole of an Oak tree. Among other species shown were the Wood White, and stunning pictures of Purple Emperor and Swallowtail butterflies. (Some of these pictures, such as the Common Blue resting on an orchid can be viewed on the website: www.georgemccarthy.com) George's talk was hugely entertaining and interspersed with all number of tales, including his efforts to gain the trust of a colony of Badgers, which successful endeavour culminated in a picture of an adult scent-marking his boot! George regularly exhibits at the AES Annual Exhibition and his pictures, no doubt, will be on display again at the Exhibition this year at Kempton Park, which will be held on Saturday the 4th of October.

Once again, it was another illuminating AGM and Member's Day, and on behalf of the AES, I would like to sincerely thank all of our speakers for maintaining the high standard of talks that we have enjoyed in recent years; the staff at London Zoo for their help (which in the case of the technical hitch was above and beyond the call of duty!) and for making this event possible; and as ever, the members and junior members for making the day such an enjoyable event. Thank you.

An Unusually Large Wasps' Nest

by Grahame Wilcox (5649)

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The photograph accompanying this short note shows a wasps' nest from my father's loft in Kidderminster, Worcestershire. Unfortunately, he had destroyed the nest before I saw it. Bodies within the debris were of the Common Wasp, *Vespula vulgaris.* To give an idea of scale, the thermostat box in the foreground is about 3 inches (7.5cm) long. However, it is nearer to the camera than the nest. I estimate that the nest was about 3 foot (90cm) tall by about 4.5 foot (135cm) wide. The combs more than filled a large bucket.

Figure 1. An unusually large wasps' nest.

Editorial Note: This is a very impressive wasp nest! The usual lifecycle of social wasps in temperate countries like our own involves the decline of the colony in autumn, and the overwintering of the newly mated queen, which then produces a new colony in spring after emerging from hibernation (Betts, 1986). This large nest may be an indication of an

extended wasp "season", foretelling events yet to come with continued global warming. In New Zealand, where the Common Wasp, *Vespula vulgaris*, and the German Wasp, *Vespula vulgaris*, became established in 1978 and 1944 respectively, the "temperate" lifecycle is not observed, and colonies thrive throughout the year, resulting in the construction of 'supernests'. To quote from "The pressures on our biodiversity", a chapter in a New Zealand government document describing the "State of New Zealand's Environment" (1997):

> The German and Common European wasps... are now widespread in New Zealand forests. In southern Beech forests, their biomass in infested areas can exceed the combined biomass of birds, rats, mice, stoats and ferrets, and in podocarp forests, nests as large as 14 cubic metres have been found. Apart from posing a hazard to people visiting the forests, the wasps appear to compete with native wasps and bees, prey on the larvae of native moths, butterflies and other insects, compete with birds for honeydew and insects, and may be accelerating the decline of the Yellowhead and Kaka (native birds)".

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Close encounters with Hornets

by Edward H. Moss. (3013)

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On 21st May 2002, I was working in my garden shed, when I was startled by a very loud buzzing. To my surprise and delight, I was being investigated by a Queen Hornet (*Vespa crabro* L.). It examined every corner of the shed, and eventually flew off. I was thrilled to have seen this large insect at such close quarters, thinking to myself that I would probably not have another experience like that. It is quite awe inspiring to be in a confined space with such a magnificent insect.

However, on 3rd June I spotted a Queen Hornet resting on the garage window-sill. It seemed reluctant to fly, but tilted its body away from me and raised its legs in a defensive posture. I ran indoors and returned with my video camera. She made no attempt to fly, and allowed me to film her at my leisure. On closer examination I discovered that two wings were missing from one side of the body.

It was rather sad to see this creature in such a bad way. Perhaps this was the one that had paid me a visit previously in the shed, and the nest would now be without a Queen.

However that is not the end of the story. Five days later, on 8th June, my wife opened the front door to go out. As she did so, a Hornet flew in. It was another Queen. It flew noisily up and down the glass panel in the hall. After a short skirmish I managed to capture and release her. (The Hornet that is!) My wife is quite used to being confronted by all sorts of strange creatures by now (she would have to be, having been married to me for just over fifty years). However, on this particular occasion, she decided this was not a good place to be. To be some where else, sooner rather than later might be a good idea.

Twelve days later, on 20th June, I was in the garden shed when once again I was buzzed by a Queen Hornet, and yet again the same thing happened on 24th June. There is not the slightest doubt that they were all Queens. To date I have not seen any workers. That makes a total of five sightings in about four weeks, and they are by no means a common insect.

I have not discovered the origin of these insects. It is certainly not my shed. Opposite the bungalow there is a green with several mature oaks and some old willows, but I have so far found no sign of them there.

Many people will perhaps never see a Hornet during the whole of their lifetime, I therefore feel very privileged, that I have had not one, but five close encounters of a most exciting kind.

How I shook the hand of the man that shook the hand of Michael Palin – A Bolivian journey (1998) – Part 1

by Don McNamara (5537)

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The literature from Worldwide Entomological Group Travel suggested that there would be Pink River Dolphins.

Also, there could be sightings of Jaguars, abundant wildlife, cloud forest, rain forest with myriads of butterflies, the Altiplano. There would be dramatic landscapes, rampant nature, evidence of a vibrant pre-Colombian culture … strangeness, excitement. It would be not unlike a passage from the Lonely Planet Guide to Bolivia! With like-minded companions – a disparate bunch of entomologists, hungry for wild places – surely a three-week trek around Bolivia held mouth-watering prospects.

Indeed, the itinerary showed me that we would fly into La Paz, about 4km above sea level. By various means of road transport, we would, over a period of about three weeks, gradually descend. We would stop off for a day or so at small towns and villages, take in various types of landscape and hopefully be able to see a good range of wildlife. We would possibly include some primary forest, do a bit of photography and, most importantly for me at least, capture one or two spectacular butterflies.

In addition to all this, here was a real chance to catch a glimpse of a pre-Colombian past. About half of the population of Bolivia is descended from the ancient line. Hence, in their dress, customs, etc there would be many signs of the Incas.

The trip was booked a year in advance. As the day approached, the 3rd of September, the tingle of nervous expectation grew. Had the equipment been checked? Was it all there? Did I have the correct type of anti-malarial tablets? What about Chaga's disease? Did I really want to go to Bolivia and cross terrain undoubtedly dramatic and beautiful, but referred to as "unforgiving"?

The organiser, Ian Wallace, who was to accompany us, had provided each of the group with details of other travellers. There were to be nine other travellers. Thankfully, I had travelled with five of them before. A few swift telephone calls – doubts and worries were cleared up. Not only that, but we were told that, on arrival in Bolivia we would have a "native speaker, guide and professional entomologist, a lady who had been with some of us before in Ecuador". Susana Bermeo Velastegui is a guide and

professional entomologist who runs her own tours in Ecuador, based on Banos. She was to fly from Ecuador to Bolivia to meet us at La Paz to sort out the day-to-day details.

So, a carefully organised journey (eight years in the planning I had been told) would ensue, which would satisfy all our entomological desires. What delights lay ahead? What could possibly go wrong?

It is said that the longest journey starts with the first step. I had already been in a high state of nervous anticipation for about a year, so was determined that, as soon as I left the front door, the "journey" would begin. The bus to Heathrow wound its way through the environs of West London – passing the friendly little houses and the many open spaces still gracing this part of the world. I am sure the passengers took on a Hispanic demeanour, the little snippets of conversation that drifted my way – could that be Quecha or a Spanish dialect? More probably good old West London or even Hindi or Gujarati. We live in interesting times.

I am still excited by aeroplanes and only just about understand the physics that describes heavier-than-air flight. Planes buzz in from all around the world. There are now so many that their very numbers threaten our tranquillity – but, far away places with strange-sounding names …

The pleasure of meeting old buddies was marred by a touch of anxiety. The organiser could not be with us for domestic reasons, so we were to travel to Bolivia under our own initiative. We had the tickets. They were posted somewhat too near the actual departure date for comfort, but all arrived safely. So, after the "hellos", we nervously boarded the waiting plane – and met a newcomer to our group, a "dragonfly" man.

Many South Americans, and no doubt others, have this habit of crossing themselves at the point of departure. They do the same thing on landing, which is also accompanied by applause. I must admit that this was not the first time that this occurred on a journey by plane, but it still has an unnerving effect on me. I would rather depend on good maintenance, engineering and efficient security than to leave it to the hands of deity. After three of the most exciting weeks, touring Bolivia, where I and my companions learned the meaning of "unforgiving landscape", on landing back at Heathrow, we burst into spontaneous applause (and briefly looked skywards – you have got to cover all bets). We were thankful for the skills and devotion of the staff, maintenance crew, stewardesses, pilots – all the employees of Varig Brasilian Airlines. We were shaking hands with strangers.

To be continued: (2) How we got to know Pachamama.

Is *Omaloplia ruricola* (Fabricius, 1775) myrmecophilous?

by Dr Peter G. Sutton (7388)

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Introduction: Living with ants (Myrmecophily)

Ants have an extraordinary number of relationships with other members of the animal kingdom. Many of us are familiar with the close relationships that exist between the larvae of Lycaenid butterflies such as the Large Blue. *Maculinea arion*. and the Silver-studded Blue. *Plebeius (Plebejus) argus*. but these form only a tiny fraction of the fascinating array of relationships that can occur.

In 1927. H. St. J. K. Donisthorpe published a book about these relationships. *The Guests of British Ants. Their Habits and Life-Histories*. which is widely recognised as being an essential piece of literature for those who are interested in this subject. In this work. Donisthorpe describes the multitude of species that may be found in association with ants. and the various types of relationship that exist between ant and myrmecophile. from the mutually beneficial symbiosis that occurs between ants and *e.g.* aphids (where the ants offer protection to the aphids that they "milk" (Trophobiosis) for their sugary secretions). to less satisfactory relationships with entoparasites such as certain members of the Ichneumonidae. which spend part of their life developing in the bodies of their hosts.

This book reveals how some species (mainly Coleoptera) have co-evolved with ants to such an extent. that they have become supremely adapted to life within the ant nest. These species have characteristically modified bodies which contain tufts of hairs called trichomes. which are situated above glands which produce sweet aromatic secretions. In return for these secretions the 'guest' is fed by the ants.

Among the myrmecophilous Coleoptera are included two members of the chafer and dung beetle Family (Scarabaeidae): the Rose Chafer. *Cetonia aurata*. which is known to occasionally develop in the nests of ants: and the Northern Rose Chafer. *Potosia cuprea*. which is truly myrmecophilous and develops in the nests of the wood ant. *Formica rufa* and similar species. Donisthorpe describes the discovery of Rose chafer larvae in the nests of *Formica rufa* in the New Forest. and states that the myrmecophilous behaviour of the Northern Rose Chafer has been known since 1603. when Caspar von Schwenkfeld described a gold beetle that hatches from a white worm found in ants' nests! (These large

larvae are much prized by Badgers and other mammals, which cause great damage to the ants' nests during this pursuit.)

No mention is made in any literature (to my knowledge) of other British members of this Family being associated with ants, with the exception of *Omaloplia ruricola*, which is described by Jessop (1986) as being "possibly myrmecophilous".

More about *Omaloplia ruricola*

Omaloplia ruricola is a small (5 – 7.5 mm) chafer beetle (Plate 1) that has always been a very local and rare species in the British Isles, although it can sometimes occur in good numbers where it can be found.
There appears to be very little information available about this small attractive species, and Jessop (*loc. cit.*) does not elaborate on how the suggestion that it might be myrmecophilous was reached. The sum of the information gathered from a variety of texts is as follows:

Omaloplia ruricola, which is the only British member of this genus, is found in warm dry (calcareous) grassland habitats in England, often on sunny sparsely vegetated hillsides. Adults are most commonly observed flying at around midday in sunny conditions, but are also known to fly during the evening. The larvae of this species live in the ground where they are believed to feed on roots. Adults, which can be found feeding on flowers, are most commonly seen in June and July flying low above vegetation, although they are also occasionally observed in May and August.

This species has been recorded from the following counties: Kent, Surrey, Hampshire, Gloucestershire, Cambridgeshire, Sussex and Norfolk, and is perhaps most numerous on the South Downs in Sussex (Jessop, *loc. cit.*).

Observation of adult emergence in the presence of Yellow Meadow Ants *Lasius flavus*

I have observed *Omaloplia ruricola* on a regular basis along the South Downs between Brighton and Lewes in the months of June and July since 1991. It is a species which can be found without too much difficulty on warm south-facing slopes of dry calcareous grassland, provided that the habitat is in good condition (generally lightly grazed unimproved flower rich grassland) and conditions are bright and sunny.

On the 13th of July 2002, in a downland combe near the village of Kingston near Lewes in East Sussex, I observed a freshly emerged specimen which was surrounded by what I believed to be Yellow

Meadow Ants *Lasius flavus*. The chafer appeared to have emerged from a small pile of soil from which the ants had also appeared, suggesting that it had pupated in the ants' nest, and that it could be a myrmecophilous species. Clearly this is inconclusive, and the species of ant present at the site requires confirmation, but this observation provides the basis for further investigation. There were many adult chafers present, which were flying low above the flower rich meadow grasses, and carried on doing so with decreasing frequency until the sky became overcast at approximately 2.30pm. Most of the flowers were leguminous, with carpets of small vetches, and the meadow grasses, which were becoming quite tall at this stage of the season, provided perfect cover for our rarest bush-cricket, the Wartbiter, *Decticus verrucivorus*, which was present in very small numbers as final instar nymphs.

Acknowledgements

Thanks to Peter Hodge for useful discussion.

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Hardly a mini-beast – obscure and curious items of entomological literature, part 3

by Richard A. Jones

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Over several years, Brian Gardiner, a previous editor of this journal, published a series of articles on some lesser-known entomological books in his library. He did this in a spirit of clearing up some bibliographical inconsistencies, giving interesting background to several important and historical works. In a similar vein I offer some details of a few obscure and curious books that have found their way into my own library. However, in a departure from Brian Gardiner's theme, the books I offer are not useful key works by important entomologists, they are strange oddities, quaint and off-beat. But they are all peculiarly entertaining and I treasure them all.

Buffon's system of natural history, in two volumes (1811)

Buffon's *Natural history, general and particular* was a major and important work by one of the 17th century's most prominent naturalists. It was begun in 1749 and completed 15 volumes later in 1767, although there were several more volumes of supplements after that date. Over the next 50 years, and long after Buffon's death in 1778, his magnum opus went through many editions, in various sizes and with varying numbers of engraved plates. This small, popularized, abridged, two-volume octavo (8 × 5 inches) edition was very much aimed at the lower end of the market. Insects are covered in volume 2's chapters 35 to 38 (pages 180 to 365), although other invertebrates such as molluscs, worms and various "animalcula" appear in other chapters.

The first thing that struck me about the book, were the strange copper-engraved plates, 80 of them. Although some were remarkably accurate and life-like, such as the flea, the head louse and several butterflies and moths, others such as the crickets and locusts show scrappy ill-understood creatures that could have been drawn better by a ten-year old. One of the scorpions appears to be winged! What is probably the death's-head hawk-moth looks more like the comically-surprised-head hawk-moth and the rhinoceros beetle appears to have little four-toed feet and a walrus-like tusk sticking out of its mouth. Having said this, nothing compares to the illustration of the blunt-headed cachalot, earlier in the book. It shows a Disneyesque whale-like creature with inane toothy grin and remarkably smirking human-looking eye. At

least the unnamed "whale" below is rather more life-like even though it is obviously dead, lying on the shore, with a top-hatted axe-man standing poised ready to hew it into pieces of meat.

The text is generally well written and accurate by modern standards, although there are some quaint misunderstandings. I was delighted to read that, despite its name, the earwig cannot possibly penetrate the ear because "the ear is already filled with a substance which prevents any insects from entering; and, besides, it is well lined and defended with membranes, which would keep out any little animal, even though the ear-wax were away". A page of very accurate and well-observed description on "spermatic animals... found in the semin masculinum of every animal" appears in the chapter on animalcules even though their precise biological role does not seem to be known. However, there is one seemingly ludicrous entry in the book that made my jaw drop when I read it.

In volume 2, on page 128, is an account of the Kraken, "an amazing large sea animal, said to be seemingly of a crab-like form... which seems an English mile and a half in circumference". Three pages are dedicated to this supposed crustacean creature, although the quoted observations are all second, third or fourth hand. Accounts are given of how a specimen "perhaps a young and careless one, as they generally keep several leagues from land" got its horns caught on trees between the cliffs and rocks at Alstahoug, near Nordland, in 1680, after which it putrified on the spot. On another occasion two fishermen came upon the water "full of the creature's thick slimy excrements... which it voids for some months" and had their boat wrecked by the beast's horns. Throughout the account is constant mention of the fact that "those who affirm they have seen its body, declare, it is more like an island than a beast", quoting mythical moving islands such as Gummars Ore near Stockholm, Lemair and Faroe.

Perhaps it was not the literary style of the time, but nowhere is there any apparent sign of scepticism in the text. However, the author is clear that all these accounts are based on the reports of others. And yet elsewhere in the book the existence of dragons is rejected as "the invention of fable and superstition... [the only like animal being]...the flying lizard, a little harmless creature, that only preys upon insects, and even seems to embellish the forest with its beauty". The only thing he says about the plausibility or not of the kraken is in his closing sentence: "In fine, if the existence of the creature is admitted, it will seem a fair inference, that he is the scarcest as well as the largest in our world; and that if there are larger in the universe, they probably inhabit some sphere or planet more extended than our own."

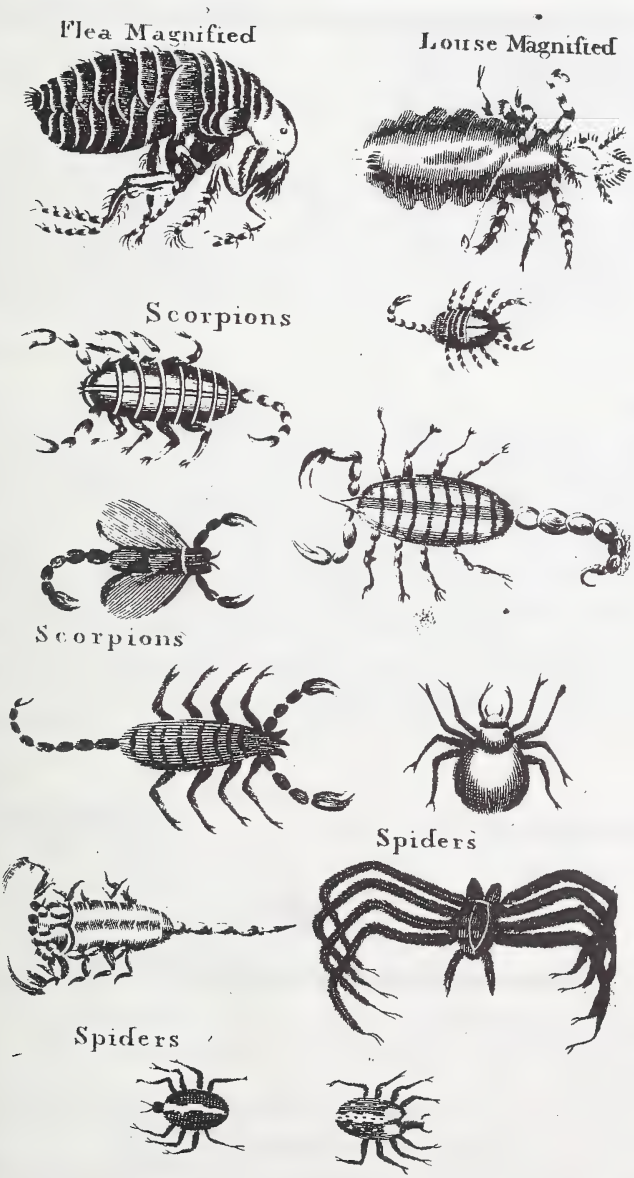

Figure 1. A moderately life-like flea and head louse, but some fairly fanciful scorpions including a winged species!?

Scanning of Specimens in a Museum Collection

by Craig Macadam (11277)

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Introduction

The Digital Dragonflies project, sponsored by the Texas Agricultural Experiment Station, is using flatbed scanners and image processing software to produce a series of digital images of dragonflies found in the Stephenville, Texas area. This paper explores the possibility of using this concept to digitise Ephemeroptera (mayfly) specimens in museum collections.

Methods

The images produced by the Digital Dragonflies project are created from live specimens, sedated by cooling for 30 minutes in a refrigerator, before scanning on a standard flatbed scanner. To scan specimens in a museum collection we need to account for the pin.

Pinned specimens of a sub-imago of *Ephemera danica* Müller, 1764 and a *Baetis* imago were obtained from the JJFX King collection held at the University of Glasgow Zoology Museum. The head of the pin in each specimen was cut off as close to the specimen as possible. The specimen was then pinned to a piece of plastazote foam. This foam was in turn pinned to a polystyrene tray (see fig 1).

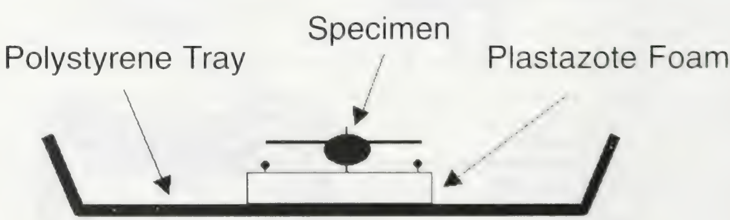

Figure 1. Specimen Preparation

Results

The results of this study are promising. The specimen of *Ephemera danica* had a wingspan of approximately 40mm and although the specimen was over 100 years old and in less than perfect condition, the scans picked up details of wing and abdomen coloration and wing venation (Fig 2). Focussing the scan on a wing provided an enlarged image of the wing venation (Fig 3).

Figure 2.
Ephemera danica Müller, 1764

Figure 3.
Ephemera danica - close up of wing.

Scanning of the *Baetis* specimen was less successful. This specimen had a wingspan of approximately 10mm. Employing similar techniques as with the specimen of *E. danica* produced an image that appeared to be out of focus. Repositioning of the specimen and increasing the resolution of the image did not bring the image into focus. In addition, the transparent wings of the *Baetis* imago were not visible against the white background of the plastazote foam. A piece of black card was placed between the specimen and the foam. Further scanning, together with adjustments to the image brightness and contrast did show up the wings, however the venation was virtually indistinguishable from the wing membrane.

Conclusions

The use of flatbed scanning technology to capture images of insect specimens in museum collections is possible for larger specimens. Further experiments with a range of different sized specimens would establish a minimum feasible size for scanning.

Acknowledgements

Many thanks to Geoff Hancock and Maggie Reilly of the University of Glasgow's Zoology Museum for access to the JJFX King collection and scanning equipment.

Reference

The Digital Dragonflies Project – http://www.dragonflies.org

Classic Entomological Sites: The Isle of Portland, Dorset

by Dr Peter G. Sutton (7388)

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The Isle of Portland, a potted history

The Isle of Portland is a promontory of oolitic limestone that extends southwards into the English Channel from the Dorset coastline near Weymouth (Figure 1). It was formerly isolated from the mainland (although it could apparently be reached *via* an exposed sand bar at low tide), and there are records of a ferry operating from Smallmouth to the island from as far back as 1244. Portland is now connected to the Dorset coastline by a shingle ridge, Chesil Beach, which forms the seaward boundary of a nationally important tidal lagoon known as The Fleet. The establishment of this permanent land bridge occurred as a result of two great storms during the 19th century. The first, in 1824, was said to have "rendered the passage four times greater than before", and the second, was responsible for producing the great bank of shingle which now forms the eastern end of Chesil Beach, which was substantial enough to form the foundation for a road and rail link to the island.

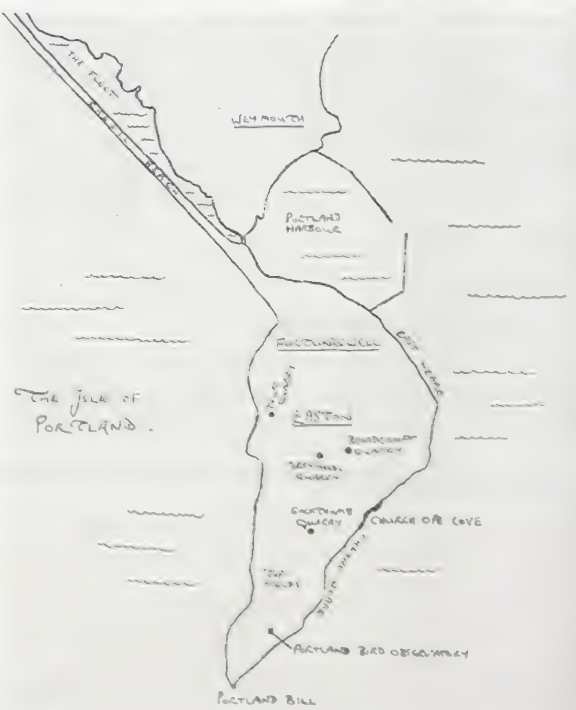

Figure 1: The Isle of Portland

The Isle of Portland is four miles long by one and a half miles

wide, tapering to a point at Portland Bill. It has a long history of human occupancy and was known during the Roman occupation of Britain as *Vindilis*. The fields of Portland were worked for crop production and there is still evidence of the Mediaeval field systems that existed to the south of Southwell. Artefacts of human habitation from the Mesolithic period show that the island has been actively inhabited since at least 5000 BC, and the presence of additional material from Neolithic, Bronze and Iron Age periods found on the southern half of the island has allowed much of the land near the tip of the Bill to be protected under the regulations for ancient monuments.

In addition to land management for crops, Portland has long been known for its association with sheep, which have been shaping the character of its landscape and wildlife for centuries, if not millennia. The Exeter version of the Domesday Book compiled during the 11th century records the presence of 900 sheep on the Isle, confirming that sheep farming was already well established at that time. In later years, quarrying for Portland limestone, together with the establishment of a large naval base, also became important factors in the island's economy.

Quarrying began on a large scale during the 17th century, when Sir Christopher Wren chose Portland limestone as a suitable building material for the construction of churches and other buildings, including St. Paul's Cathedral, during the process of rebuilding London after the Great Fire of 1666. Much of the limestone that is still extracted from Portland's working quarries today is used for the restoration of old limestone buildings.

Portland "blues", quarries, and Sir Christopher Wren

Portland is a delightful place for the lepidopterist and is endowed with an extraordinary number of butterfly and moth species, including some extreme rarities. Portland supports 34 of the 58 resident UK breeding species of butterfly. The Isle is particularly important for its colonies of "blue" butterflies, and with the obvious exception of the Large Blue, *Maculinea arion*, and Northern Brown Argus, *Aricia artaxerxes*, all other species are present, including the Small Blue, *Cupido minimus*, (which has declined by over 50 % since the 19th century (Asher *et al.*, 2001) and continues to decline in most areas across its British range) and the *Cretaceus* form of the Silver-studded Blue, *Plebeius (Plebejus) argus cretaceus**, which is now found in only a handful of sites, principally in abandoned quarries, on the Isle of Portland. The other species present are the dazzling Adonis Blue, *Polyommatus (Lysandra) bellargus*; the

* see *Bulletin* No. 443 (August 2002) for colour photographs of this form

Common Blue, *Polyommatus icarus*; Holly Blue, *Celastrina argiolus*; Brown Argus, *Aricia agestis*; and the Chalkhill Blue, *Polyommatus (Lysandra) coridon*. The Isle of Portland has been described as one of the very few places where the Chalkhill Blue can be found in "unforgettable abundance" (Thomas *et al.*, 1998).

Quarrying has had a huge impact on the nature of the Isle in terms of its biodiversity, and latterly, abandoned quarries have become vitally important refuges not only for Portland's outstanding lepidopteran fauna, but also for a wide variety of flora and fauna from rare plants to scarce bats.

In recent years, in an attempt to conserve the last remaining colonies of Portland's now endemic *Cretaceus* form of the Silver-studded Blue, Butterfly Conservation has managed to secure the purchase of Perryfields Quarry, and leased an area of Broadcroft Quarry from Hanson Aggregates, to form two Butterfly Reserves.

The slow regeneration of herb-rich turf in abandoned limestone quarries, which supports the respective food plants and species of ant associated with the lifecycles of the Portland "blues", has been largely responsible for the success of these species on the island at a time when changing land use (coupled with the effects of *myxomatosis* in Rabbits) has caused such a spectacular decline in the fortunes of most of these species in mainland Britain. There is a subtle irony in the idea that these species have prospered as a result of such a destructive anthropogenic activity, but the extraordinary fact remains, that in addition to leaving a legacy of inspiring architecture, Sir Christopher Wren's choice to use Portland limestone during the reconstruction of London may have more of a bearing on the current fortunes of these "blues" than we are perhaps prepared to acknowledge**.

A range of habitats

The abandoned quarries provide a focal point for naturalists, but comprise only part of a diverse range of habitats that can be found on the Isle of Portland. There is little woodland remaining on the Isle, but enough to support a range of woodland species including the longhorn beetle, *Rutpela (Strangalia) maculata*, the Wasp Beetle, *Clytus arietis*, the Cardinal Beetle, *Pyrochroa serraticornis*, the Lesser Stag Beetle, *Dorcus parallelipipedus*, the Cockchafer, *Melolontha melolontha*, and even the beautiful Rose Chafer, *Cetonia aurata*.

Limestone grassland, including a rare calcareous grassland habitat dominated by Upright Brome, *Bromus erectus*, forms another important

** Or should our gratitude be directed towards the careless baker in Pudding Lane?

Plate 1: The small chafer, *Omaloplia ruricola*, is a "rare and local" species found on dry chalk Downs in southern England.

Plate 2: The presence of the nationally scarce Tawny Cockroach, *Ectobius pallidus*, has recently been reconfirmed on Portland.

Plate 3: The Grey Bush-cricket, *Platycleis albopunctata*, (Notable b) generally has a strictly coastal distribution in southern England and Wales.

Plate 4: A Portland specimen of a very rare aberration of the Wall Butterfly, *Lasiommata megera* ab. *xanthos* (Frohawk)

Plate 1: Sutton, Is *Omaloplia ruricola*... Photo: Peter Sutton

Plates 2-4: Sutton, Classic Entomological Sites: Portland, Dorset Photos: Peter Sutton; Plate 4, Ken Dolbear

Plate 5: The exquisite Wasp Spider, *Argiope bruennichi*, formerly a south coast speciality, has experienced a considerable range expansion in recent years

Plate 6: A rarity virtually confined to Dorset, a colony of the Lulworth Skipper, *Thymelicus acteon*, appeared on Portland for the first time during the 1990s

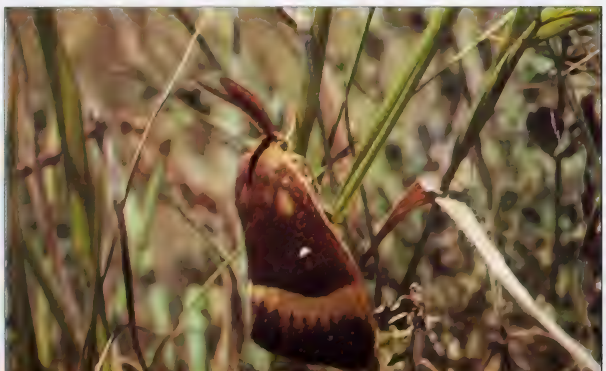

Plate 7: The day-flying Oak Eggar Moth, *Lasiocampa quercus*, is abundant among the grasses of Broadcroft Quarry on Portland in July

Plate 8: The Ruddy Darter, *Sympetrum sanguineum*, and several other species can be found at quarry ponds on Portland

Photos: Peter Sutton

Plate 10: Southern Swallowtail - Samos

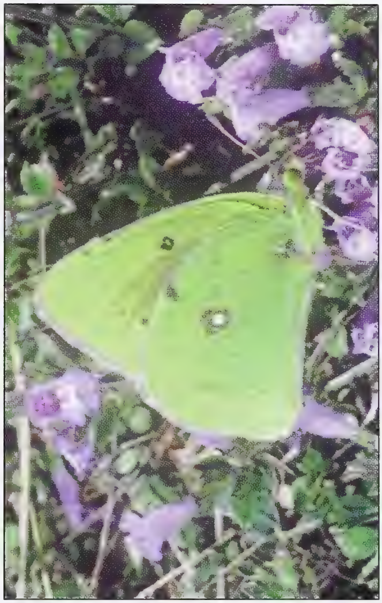

Plate 12: Greek Clouded Yellow - Chelmos

Plate 9: *Hipparchia mersina*, Samos. (This species is not found in Greece or Chelmos)

Plate 11: Odd-spot Blue - Chelmos

Plates 9-12: Rowlings, Greek...

Photos: Matt Rowlings

Podarcis muralis, which is now an established resident; people swimming with Bottlenose Dolphins, *Tursiops truncatus*; Green-winged Orchids, *Orchis morio*, growing on the slopes of The Bill; and pictures of the spectacular Monarch, *Danaus plexipus*, from the 2001 influx.

The insects of the Isle of Portland

Lepidoptera

Recent maps of butterfly distribution on Portland are provided by Thomas *et al.* in the *New Atlas of Dorset Butterflies* (1998). The "blue" butterflies have already been mentioned, but other noteworthy species include the Lulworth Skipper, *Thymelicus acteon* (Plate 6) which recently colonised the Isle of Portland during the 1990's; Dingy Skipper, *Erynnis tages*; Grizzled Skipper, *Pyrgus malvae*; Marbled White, *Melanargia galathea*; Dark Green Fritillary, *Argynnis aglaja*; Wall, *Lasiommata megera* (Plate 4 shows a specimen of a very rare aberration of this species, *Lasiommata megera* ab. *xanthos* (Frohawk), which was found and photographed on the Isle by Ken Dolbear); and the Grayling, *Hipparchia semele*. As for the ornithologist, Portland is a remarkable place for Lepidopterists wishing to record migrating species, and the Monarch; Large Tortoiseshell, *Nymphalis polychloros*; Long-tailed Blue, *Lampides boeticus*; Pale Clouded Yellow, *Colias hyale*, and Berger's Clouded Yellow, *Colias alfacariensis*; have all been recorded in recent years.

There is an almost incomprehensible number of macro- and micro-moths (over 1000 species) that have been recorded from the Isle of Portland. (Some of Portland's specialities were introduced earlier in this *Bulletin* in the description of Phil Sterling's talk at this year's AGM.) Again, the Wildlife Diary on the PBO web-site is the place to view many of these species, and among some of the more beautiful and noteworthy species shown are: Bedstraw Hawk-moth, *Hyles gallii*; Striped Hawk-moth, *Hyles lineata* (a formerly rare immigrant which is appearing with increasing frequency); Bloxworth Snout, *Hypena obsitalis* (a formerly rare immigrant which is now believed to be an established resident on Portland); Six-belted Clearwing, *Bembecia scopigera*; an almost fully-grown Convolvulus Hawk-moth caterpillar, *Agrius convolvuli*, found in Tout Quarry; Rosy Footman, *Miltochrista miniata*; Jersey Tiger, *Euplagia quadripunctaria*; and Garden Tiger, *Arctia caja* (including an unusual aberrant specimen).

For those who are interested in the extensive Lepidoperan fauna of Portland, Martin Cade has produced regular reports which have been published in *Atropos*, including systematic lists of the immigrant and

dispersive species recorded from the light traps at the Portland Bird Observatory (Cade, 1996, 1998, 2000, 2001, 2002). Martin has also produced a useful site guide in the same journal (Cade, 1997) describing the location of some of the best sites, including the abandoned quarries, to set up light traps for monitoring resident and migrating species.

Odonata

The lack of suitable wetland habitat on Portland means that there are comparatively few species of dragonflies and damselflies present, but there are still a few surprises. The Ruddy Darter, *Sympetrum sanguineum* (Plate 8) has been known to breed in quarry pools, as has the Red-veined Darter, *Sympetrum fonscolombei*, an increasingly regular migrant which has also been observed laying eggs in the PBO pond.

Other species that have been recorded on the island are: Common Blue Damselfly, *Enallagma cyathigerum*; Azure Damselfly, *Coenagrion puella*; Large Red Damselfly, *Pyrrhosoma nymphula*; Blue-tailed Damselfly, *Ischnura elegans*; Broad-bodied Chaser, *Libellula depressa*; Four-spotted Chaser, *Libellula quadrimaculata*; Black-tailed Skimmer, *Orthetrum cancellatum*; Migrant Hawker, *Aeshna mixta*; Common Hawker, *Aeshna juncea*; Emperor Dragonfly, *Anax imperator*, and the Common Darter, *Sympetrum striolatum*.

The Yellow-winged Darter, *Sympetrum flaveolum*, another increasingly regular migrant, has also been recorded on a number of occasions, and the Vagrant Emperor, *Hemianax ephippiger* was recorded in 1983. Other "wanderers", many of which have presumably strayed from sites in Britain, include the Banded Demoiselle, *Calopteryx splendens*; Keeled Skimmer, *Orthetrum coerulescens*; Brown Hawker, *Aeshna grandis*; Southern Hawker, *Aeshna cyanea*; and the Black Darter, *Sympetrum danae*.

The Scarce Blue-tailed Damselfly, *Ischnura pumilio*, which was recorded for the first time three years ago in Yeolands Quarry, has appeared every year since, suggesting that it may have become established as a breeding resident.

Orthoptera

Portland has a great deal to offer the orthopterist, and although the absence of some species may reflect the general lack of woodland, wetland and other specific habitats on the Isle of Portland, other species can be found in good numbers. The Great Green Bush-cricket, *Tettigonia viridissima*, which is one of Europe's largest insects, is the

most impressive species to be found on the Isle, and its loud song can be heard from late July onwards. The Grey Bush-cricket, *Platycleis albopunctata* (Plate 3) is a nationally scarce species (Nb) which was formerly restricted to coastal habitats in Britain. Very recently, this species has shown the first signs of movement inland away from this traditional habitat. The Grey Bush-cricket occupies a range of habitats on the Continent, and it is possible that, as we have seen for an increasing number of British species that are at the north-western limit of their European range, climatic amelioration is responsible for "loosening" their formerly stringent habitat requirements. The Long-winged Conehead, *Conocephalus discolor*, which is also present, provides a spectacular example of a species which has undergone what some have described as an "explosive" range expansion. Formerly a red data book species restricted to a few counties on the south coast of England, it has, over the past three decades, marched northwards at such a rate that it is now an established resident in Wales, East Anglia and the Midlands.

Other species present on the Isle are: Dark Bush-cricket, *Pholidoptera griseoaptera*; Oak Bush-cricket, *Meconema thalassinum*; Speckled Bush-cricket, *Leptophyes punctatissima*; Common Groundhopper, *Tetrix undulata* (it is possible that the rare Cepero's Groundhopper, *Tetrix ceperoi*, could be present on suitable undercliff sites, particularly soft rock habitat with wet springs and flushes); Common Green Grasshopper, *Omocestus viridulus*; Field Grasshopper, *Chorthippus brunneus*; Mottled Grasshopper, *Myrmeleotettix maculata*; and the Meadow Grasshopper, *Chorthippus parallelus*. Two of the three native British cockroaches are present: the Tawny Cockroach, *Ectobius pallidus* (Plate 2); and the Lesser Cockroach, *Ectobius panzeri*; both of which are nationally scarce (Nb). Of the earwigs, three species have been recorded: Common Earwig, *Forficula auricularia*; Lesser Earwig, *Labia minor*; and recently, the nationally scarce Lesne's Earwig, *Forficula lesnei* (Nb).

Finally, mention must be made of the Scaly Cricket, *Pseudomogoplistes vicentae*, which can be found on the shingle ridge that links the Isle of Portland to the mainland. For many years, the eastern end of Chesil Beach was thought to be the sole British site for this elusive RDB1 species, but remarkably, it has since been found at two more shingle sites in Devon (Sutton, 1999) and Wales respectively. A search along the seaweed strand line may yield a specimen or two of this unusual rare species.

Hymenoptera

There is much scope for Hymenopterists to increase the current knowledge of bees, wasps and ants on the Isle of Portland, and there

are four provisional atlases (Edwards, 1997 & 1998; Telfer and Edwards, 2001 & 2002) describing the distribution of the aculeate Hymenoptera in Britain and Ireland, that are recommended to gain a knowledge of species that have been previously recorded, and to place new records into perspective.

It is clear that many records need to be revised. For instance, there are pre-1970 records for a number of scarce species which have not been recorded recently, but which may still be present in suitable habitats, including: the pompilid wasp *Aporus unicolor* (Na); the sphecid wasps *Podalonia hirsuta* (Nb), *Tachysphex unicolor* (pRDB), *Nysson dimidiatus* (Nb), and *Ectemnius succinctus* (Nb); the ruby-tailed wasps *Chrysis viridula* (which has no threat status but should be reviewed in the light of its considerable disappearance from sites across its range), and amazingly, *Chrysis fulgida* (RDB1); the ant *Leptothorax albipennis*, which is classified as Na but is now known from about 40 post-1970 10 km squares; the Melittinine bee *Melitta tricincta* (Nb); the megachilinine bees *Stelis ornatula* (Na), *Stelis punctulatissima* (Nb), and *Hoplitis claviventris* (Nb); the halictinine bees *Lasioglossum xanthopus* (Nb), *Lasioglossum angusticeps* (RDB3), and the vulnerable *Sphecodes spinulosus* (RDB2); the andreninine bee *Andrena nitidiuscula* (RDB3); the potter wasp *Eumenes coarctatus* (Na); and the bumble-bees *Bombus distinguendus* (Nb), *Bombus subterraneus* (Na), *Bombus rupestris* (Nb) and *Bombus sylvarum* (Nb).

Clearly the current threat status of some of these species needs to be reviewed, particularly for the Bumble-bees. *Bombus subterraneus*, for example, has not been recorded in Britain since 1988, and there is a real possibility that *Bombus sylvarum*, which has experienced a similar catastrophic decline, may also be lost from our native fauna if current trends continue.

Mr George Else (pers. comm. 2003) has kindly informed me that three species that are recorded in the atlases as having no post-1970 records, are in fact still present on the Isle of Portland. The extremely rare eumenid wasp, *Euodynerus quadrifasciatus*, (RDB2), which is known only from about four sites in Britain, can be locally common where it can be found, visiting the flowers of shrubs such as *Cotoneaster* sp.; the scarce and extremely similar eumenid wasp, *Ancistrocerus oviventris*, is also present; and the megachilinine bee *Osmia aurulenta* (Nb), which nests in abandoned snail shells (a few other bees, all megachilinines, do the same) can be found feeding at vetch flowers, especially Common Bird's-foot-trefoil, *Lotus corniculatus*.

Many other species can be found on the Isle of Portland, including the Yellow Meadow Ant, *Lasius flavus*, the Hornet, *Vespa crabro*, and another scarce eumenid wasp *Odynerus melanocephalus* (Na).

Coleoptera

As with the Hymenoptera, there are many species of beetle for which old records exist, but whose presence on the Isle of Portland needs to be reconfirmed, including some common species such as the Violet Ground Beetle, *Carabus violaceus*, and *Nebria brevicollis*. Many species are still expected to be found, and the carabids: *Cymindis axillaris* (Na) (Figure 2), for which there are no recent records from western Britain (Luff, 1998), *Licinus punctatulus* (Na) (Figure 3), and *Platyderus ruficollis* (Nb) (Figure 4), have all been recently been recorded on the Isle of Portland by John Walters (Scarce Ground Beetle Project). The provisional atlas by Luff (*loc. cit.*) is recommended to assess the current status of this group.

Figure 2: *Cymindis axillaris* (Na) Photo: John Walters

There are many species to be found in the range of habitats present on the Isle of Portland. Areas of calcareous grassland can produce species such as the Bombardier Beetle, *Brachinus crepitans*, (Nb) (Figure 5), the carabid *Deicheirotrichus obsoletus* (Nb), and the large click beetle, *Agrypnus murinus*. Woodland species have been discussed in brief above, and an additional cerambycid to add to that list is *Anoplodera livida*.

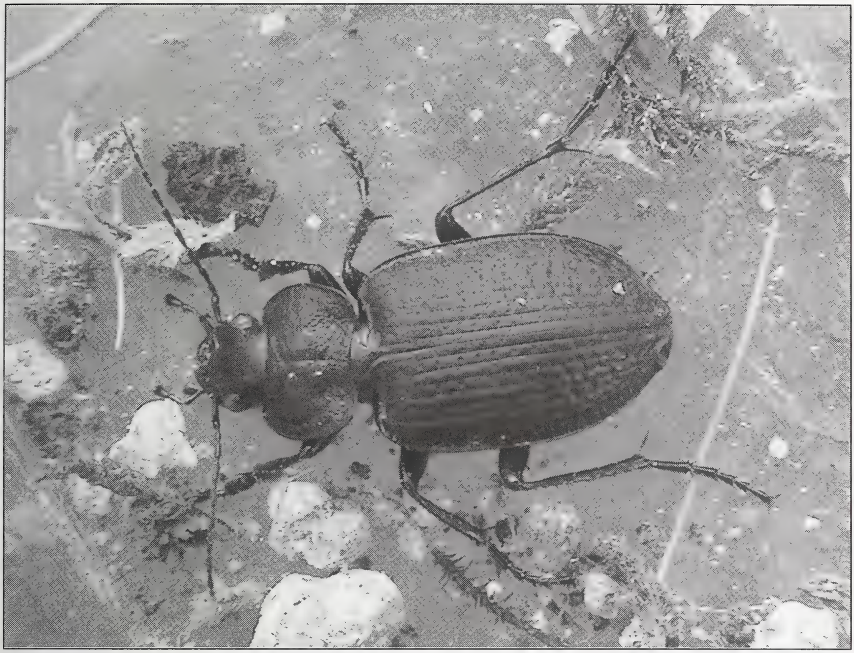

Figure 3: *Licinus punctatulus* (Na) Photo: John Walters

Coleopterists who also study Lepidoptera may be interested to know that a number of species can be taken at light traps. Mr Mike Lawn (pers. comm., 2003), in addition to kindly providing a list of Portland records including weevils (Circulionidae), leaf beetles (Chrysomelidae) and ladybirds, (Coccinellidae), also provided a list of species taken at the PBO moth traps, including: the weevils, *Curculio nucum* and *Otiorhynchus singularis*; the dung beetles, *Geotrupes stercorarius*, *Aphodius rufipes*, and *Aphodius foetidus*; and the burying beetles, *Necrodes littoralis* and *Necrophorus vespillo.*

Many other beetles can be found on the Isle, including the Bloody-nosed Beetle, *Timarcha tenebricosa*; the attractive melyrid, *Psilothrix cyanea*; and if the landbridge to the mainland is considered, the curious darkling beetle, *Omophlus rufitarsus.* This extraordinary species appears as an adult in great numbers on Thrift, *Armeria maritima*, for only one or two days in early June each year, and is confined to this single site in Britain. (A photograph of this species can be found on the PBO website).

Figure 4: *Platyderus ruficollis* (Nb) Photo: John Walters

Figure 5: Bombardier Beetle, *Brachinus crepitans* (Nb) Photo: John Walters

Other insects

There are doubtless a large number of interesting Hemiptera and Diptera to be recorded on the Isle of Portland, not to mention other species from other groups of interest. In the short time that I have spent on Portland I have encountered a healthy number of species from both groups, but again, the presence of a specialist is required to assess the current status of these groups.

Spiders

For those interested in insect predators, the first complete survey of spiders on the Isle of Portland is being undertaken by Ian Pembroke, who has produced a web-site (http://website.lineone/~ian.pembroke/) which contains an ever-increasing number of photographs (now over 100 pictures). Of the known species to date, the Wasp Spider, *Argiope bruennichi*, (Plate 5) which can be found in late summer, is arguably the most beautiful and impressive resident.

Diary notes: A visit to Portland – 30th July 2000

The purpose of this visit to Portland was to try and locate a colony of the *Cretaceus* form of the Silver-studded Blue. I had chosen to visit Broadcroft Quarry which was known to hold one of the largest colonies of this butterfly. Being unfamiliar with the site, Sara and I made our way to down deep into the quarry, which actually turned out to be the adjacent Yeolands Quarry. On the way down, on the steep sides of the sparsely vegetated limestone, was a specimen of the Ruby-tailed wasp, *Hedychridium roseum*, easily distinguished by its non-metallic red abdomen. This species, which is a new record for Portland, has a virtually identical (and restricted) range to its preferred host, the sphecid wasp, *Astata boops*, which has also not been recorded, but which may well be present in the light of this discovery.

The day was hot, sunny and very windy and we made our way down to the bottom of the quarry where there were still areas of open water. These pools were now very shallow, but had lasted long enough for Toads, *Bufo bufo*, Common Frogs, *Rana temporaria*, and Smooth Newts, *Triturus vulgaris*, which were all present in good numbers, to complete the aquatic stage of their lifecycles. Also present were the Emperor Dragonfly, Broad-bodied Chaser, Common Sympetrum, Migrant Hawker, and the Blue-tailed Damselfly. There were small areas of thin soil at the bottom of the quarry, which provided an anchor for opportunistic plants including thistles and other flowers, which provided a nectar source for

Common Blues and Chalkhill Blues. The attractive carabid, *Chlaenius vestitus*, was found under stones in the damp areas near the ponds.

Returning to the top of the quarry, we entered the Broadcroft Quarry Butterfly Reserve and began the hunt for the Silver-studded Blue, being serenaded by Great Green Bush-crickets, which were present in abundance. There were also Grey Bush-crickets, Long-winged Coneheads, and Common Green, Field and Meadow grasshoppers among the grasses.

During the fruitless search for our intended quarry, we met up with Ken Dolbear, a very knowledgeable gentleman who had studied the wildlife on Portland for many years. Ken informed us that the Silver-studded Blue season had very recently ended, but generously acted as our guide in an effort to locate any late specimens that may still have been present in the areas where its localised colonies had been found that year. As we walked through the grasses we encountered Painted Lady, *Cynthia cardui*, and Small Copper, *Lyceana phleas*, butterflies, and Six-spot Burnet, *Zygaena filipendulae*, and Oak Eggar, *Lasiocampa quercus*, moths. Ken, who also had a great interest in dragonflies, told us that the Red-veined Darter had bred in good numbers a couple of years back at the ponds we had visited earlier in the day.

The search for the Silver-studded Blue was unsuccessful, and after Ken had departed, I decided to photograph the Oak Eggar, which was present in large numbers at the site. I managed to catch up with an individual (Plate 7), but as I photographed the specimen, I suddenly became aware of an intense pain as I lay among the grasses. I had been lying on a Yellow Meadow Ants' nest and its inhabitants were letting me know in no uncertain terms how they felt about my abode flattening activities. I leapt up instantly from the grass and began a flailing repertoire to the tune of the excruciating pain from each sting, that would surely have won any freestyle dancing competition. Luckily, there are many words in the English language that can be used to express one's dissatisfaction on such an occasion, and in this instance, my familiarity with the intricacies of that language allowed me to use almost all of them.

A second visit to Portland – 14th July 2001

The quest for the *Cretaceus* form of the Silver-studded Blue continued with a second visit to Broadcroft Quarry, and we arrived at the site at 8 am. The sun shone brightly in the azure-blue sky above us, and a cool sea breeze freshened the maritime air as we walked through the first meadow, which was buzzing with life. There were grasshoppers

everywhere, the bumblebees, *Bombus lapidarius* and *Bombus pratorum*, and many Marbled Whites among the flowers and grasses.

A number of Common Lizards, *Lacerta vivipara*, were basking on a large pile of boulders in the early morning sunlight, and as I moved to get a closer look, I disturbed a brown butterfly, which I assumed to be a Brown Argus. I watched as it settled on a flower head and it suddenly dawned on me that this was in fact a female *Cretaceus* specimen of the Silver-studded Blue. It was a beautiful thing to see, on a beautiful morning, and for a while I sat on a boulder among the lizards, under the blueness, while they, in their alertness, watched me, watching the butterfly.

Before long I had found several more, including some fine blue males, and for the next hour clicked lethargicly with my camera as the early morning and sleepless night (courtesy of a pair of Tawny Owls feeding their young) took their toll. On the way back through the meadow I took some photographs of the Grey Bush-cricket and found several specimens of the Common Groundhopper.

A short drive away was Perryfields Quarry, and as we walked onto the grassland area, we were greeted, quite literally, by a cloud of Ringlets, Meadow Browns and Marbled Whites. Several more Silver-studded Blues were present, and some striking purple and green colour forms of the Meadow Grasshopper were observed. There was what appeared to be an old railway cutting on the far side of the quarry, which produced several Slow-worms, *Anguis fragilis*, the impressive chrysomelid beetle *Chrysomela banksi*, the large Narcissus Fly, *Merodon equestris*, and two pleasant surprises, the Tawny Cockroach and Lesser Cockroach, which were both found under rocks.

As we walked back through the profusion of butterflies, which now included many Small and Large Skippers, we found one more Silver-Studded Blue, and left the Isle of Portland, and its quarries, with the events of a perfect summer's day still fresh in our memories.

Acknowledgements

Sincere thanks to: Ken Dolbear (Plate 4), John Walters (Figs. 2, 3, 4 & 5), George Else and David Baldock (Hymenoptera), Phil Sterling and Martin Cade (Lepidoptera), Peter Hodge, Tony Allen, Mike Lawn, Max Barclay, Jonty Denton, Mark Telfer and John Paul (Coleoptera), for their kind generosity and expertise.

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Insect recording at Portland Bird Observatory: 2003 Highlights

by Martin Cade

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After a slow and at times even dispiriting start, 2003 has turned out to be a bumper year for Portland entomology. The early months of the year, whilst characteristically mainly mild, were almost entirely without interest until the first few immigrant Lepidoptera showed up in the last days of March. Unfortunately, this hint of interest was not sustained and for the most part a chillier, easterly influenced spring produced little of note save for a lone **Blossom Underwing** *Orthosia miniosa* in the Observatory garden moth-traps on 17th April proving once again that this local woodland species can wander considerable distances.

The arrival of warmer southerly weather at the end of May provided the cue for the first good arrival of immigrants of the year. **Diamond-back Moths** *Plutella xylostella* dominated, but among the other commoner species an **Orange Footman** *Eilema sororcula* was another unexpected woodland wanderer. **Painted Ladies** *Vanessa cardui* were conspicuous by day, and it wasn't long before **Hummingbird Hawk-moths** *Macroglossum stellatarum* were also being reported in quantity. The occasional **Clouded Yellow** *Colias croceus* showed up, although there was no suggestion that they were a local-bred generation as had been suspected in 2001 and 2002.

Interest turned to dragonflies in early June when several **Red-veined Darters** *Sympetrum fonscolombei* were discovered at Yeolands Quarry and shortly afterwards **Scarce Blue-tailed Damselflies** *Ischura pumilio* were confirmed to be present there for the third successive year.

The next wave of immigrant moths and butterflies arrived on 15th June and the ensuing few weeks were indeed a period of Portland at its best. By day, **Painted Ladies** and **Hummingbird Hawk-moths** were everywhere, whilst at night, **Small Mottled Willows** *Spodoptera exigua* staged a remarkable influx, with counts of more than 100 in the Observatory garden moth-traps, and rarities there before the month was out included two *Conobathra tumidana,* and singles of *Euchromius ocellea,* **Striped Hawk-moth** *Hyles livornica,* **Cosmopolitan** *Mythimna loreyi,* **Ni Moth** *Trichoplusia ni* and **Dewick's Plusia** *Macdunnoughia confusa.*

July begun with even more excitement when an unfamiliar noctuid moth at the Observatory was identified by Martin Honey of the BMNH

as *Lacanobia splendens* – a first record for Britain. Unfortunately for us, in a wonderful example of entomogical gazumping, our moment of glory proved to be short-lived as the publication of photographs of our specimen on the internet enabled moth-trappers elsewhere to identify several specimens that had been caught previously at other sites in Dorset and Kent! *Ethmia dodecea*, **Scarce Silver-lines** *Bena bicolorana* and **Olive Crescent** *Trisateles emortualis* were all additions to the island lepidotera list during the first half of July, whilst an **Orache Moth** *Trachea atriplicis* was another really top-notch rarity. The odonata list increased too when a **Lesser Emperor** *Anax parthenope* paid a brief visit to Yeolands Quarry. Elsewhere, pitfall trapping on Chesil Beach revealed that **Scaly Cricket** *Pseudomogoplistes vicentae* was still thriving there, being especially common close to the high water mark on the seemingly inhospitable seaward side of the beach.

After a couple of weeks of relative peace and quiet in the moth-traps, August saw an increase in numbers of immigrants as the progeny of the earlier arrivals started to emerge. **Silver Y** *Autographa gamma* increased to plague proportions both by day and night – 1550 filled the Observatory garden moth-traps on one night alone – whilst rarities included good numbers of **Convolvulus Hawk-moths** *Agrius convolvuli*, three **Langmaid's Yellow Underwings** *Noctua janthina*, a **Tree-lichen Beauty** *Cryphia algae* and a **Porter's Rustic** *Proxenus hospes*.

Greek Butterflies: Collecting on Mt Chelmos, Greece, June 2002

by Matthew Rowlings (9108)

29 Woodpath, Southsea, Portsmouth, Hampshire, PO5 3DX.

"Fabulous" is the only word that can describe this region. We visited twice in mid June and were more than impressed with this massif. The butterfly species count is more than respectable and the quality is second to none. This is home to several of Europe's most restricted species and a visit here in June was too good to miss. The town of Kalavrita was our base for a couple of days, being widely know throughout Greece as the sorry site where all 1400 men of the town were massacred by the Germans in WWII and the town subsequently destroyed by fire. The clock on one of the two towers on the town's main church has not been moved since the time the massacre occurred.

Mid June yielded us the Pontic Blue (*Neolysandra coelestina*) (Plate 14) and the Odd Spot Blue (*Turanana endymion*) (Plate 11). The former is known only from a couple of mountains in this region, Chelmos being the stronghold. It turned out to be fairly widespread and common at several sites from about 1500 to 1800m. It is a lovely rich dark blue on the upperside but fairly pale grey brown on the underside, with several distinctively distributed spots on the underside forewing. The Odd Spot Blue is a different story. Although by no means as significant as the Kalavrita atrocity, a similar fate was unfolding before our eyes. Three Dutch collectors were systematically catching every butterfly they could find and killing it without so much as looking at what they were killing. If it moved it went into the killing jar. They proudly showed me two dozen Greek Clouded Yellows (*Colias aurorina*) (live specimen on Plate 12) in one of their jars, 6 more jars were nestling in one of their carry bags, each one jammed full with butterflies. Along side were similar numbers of Olive Skippers (*Pyrgus serratulae*), of the SE European form major. They proudly boasted that there were no Pontic Blues left as they had already killed them all. Luckily I knew this wasn't true but didn't let on and certainly didn't mention where we'd just found them. They told me the Odd Spot Blue season was finished, but just 45 minutes later, we found them at a site, just a few hundred meters away catching this butterfly. Clearly they were trying to put us of the trail, leaving more live (dead) stock for them. We met a local naturalist who said it was the only place on the mountain he knew of the butterfly and, more significantly, the foodplant. The frantic sweeping of the Dutch nets actually led us to

the precise location for the Odd Spot Blue. We'd been directed to this site before we left for Greece, but our interpretation of the directions had been too liberal. However, our deviation had led us to find three excellent examples of the Inky Skipper (*Erynnis marloyi*) but this was small consolation for the Odd Spot Blue carnage we had failed to stop or even influence.

The Odd Spot Blue biotope was probably less than 100 square meters of rocky, *Acantholimon androsaceum* covered hillside surrounded by relatively lush grassy meadows containing sparse flowers. Acantholimon is a low mound forming plant with distinctive pink flowers, easily recognised when found. Our Odd Spots were exceedingly well camouflaged, being of exactly the colour of the rocks. They would usually sit with wings closed but angled towards the sun. They are so small, hardly 15mm wing span, they would vanish against the rock and the Acantholimon when flying so close to the ground. We'd missed our chance – only four Odd Spots were left alive out of a couple of dozen our Dutch acquaintances had proudly killed. The Dutch were extremely surprised I hadn't killed my four blues and even more surprised when I told them I wasn't going to and that photographs were all we were going to take.

Not wanting to open the debate about collecting, but please think extremely carefully before expanding you collection by purchasing more than the absolute minimum, and please don't buy anything from Mt Chelmos from any Dutch Collectors! I wrote to a noteworthy Greek lepidopterist on this subject who could only reply – "the Germans wiped out a colony of Odd Spots a few years ago, now the Dutch? The only way of stopping professional collecting is not to buy the merchandise". I couldn't agree more.

The sad story continues. It was with huge delight that we found the Taygetos Blue (*Polyommatus menelaos*) (Plate 13) a few days later in the extreme south of Greece. It is endemic to the Taygetos Mts., i.e. this is the ONLY mountain range in the world where this distinctive and dazzling butterfly is found. The Taygetos Mts. are narrow, about 30 miles long and rise well above the surrounding plains and drop spectacularly down to the Mediterranean on the western side. Above 1150m we found numerous male Taygetos Blues basking in the sunshine and taking salts. The great sadness was we found our Dutch collectors swinging wildly again. The only consolation here is that this species appeared to be abundant and, I hope, would not be threatened by collecting, even on this scale. I managed a single male Eastern Brown Argus (*Kretania eurypilus*) amongst the iridescent Taygetos Blues also taking salt. This

species is found nowhere else on mainland Greece, the only other European sites are on the Aegean island of Samos. It was non-descript but in perfect condition. It was good to see Speckled Wood (*Pararge aegeria*) and Lesser Fiery Coppers (*Lycaena thersamon*) on occasion as neither species are indicated as flying here by the very reliable Collins field guide by Tolman (1997).

We found the Dutch yet again. Back at Mt Chelmos at the end of June we found the very first Chelmos Blues (*Agrodiaetus iphigenia*) (Plate 16). This is possibly even more threatened than the Odd Spot Blue by the pressure of sheep. Although very early in the season for this species I managed two perfect males. I was very happy that they were widely separated in space, but I worry that the colony (females that don't wander as far as the males) would be at risk. Sure enough, just 200m from where I found our first male I also found the very same Dutch collectors! We left with a sour taste of reckless collecting, not with the good memories this area earned and deserved. We'd found more than we could realistically have hoped for, the only thing missing was the Eastern Greenish Black Tip (*Elphinstonia penia*) which is of dubious status (or at least at very low density) on Mt Chelmos. We found its foodplant, Matthiola, extremely locally but no butterflies. One last note was the Black Veined Whites (*Aporia crataegi*). These were extraordinarily abundant on Mt. Chelmos, a hundred being visible at any one time (Plate 15). There were so many that the grassy meadows seemed to move with them at times. They were presumably utilising the common scrub hawthorn (*Crataegus pycnoloba*) found across the area.

Acknowledgements

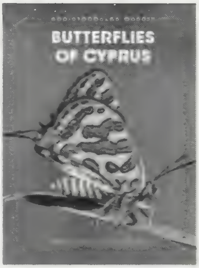
Sincere thanks to my father, Peter Rowlings for providing the superb colour photographs that accompany this article, and also for providing photographs which illustrate two species, *Hipparchia mersina* (a Grayling) (Plate 9), and the Southern Swallowtail (*Papilio alexanor*) (Plate 10), which were described in an article (Samos and Patmos, June 2002) published in the previous edition of the *Bulletin*.

References

Olivier, 1993, *Butterflies of the Greek Island of Rodos.*
Tolman, 1997, *Butterflies of Britain and Europe, Collins.*

Book Review

The Butterflies of Cyprus



by Christodoulos Makris. Published by the Bank of Cyprus Cultural Foundation 2003, 330pp., colour photographs throughout. Hard cover 42.85 Euros / £29.50 ISBN 9963-42-815-0. Soft cover 37.72 Euros / £25.80 ISBN 9963-42-817-7.

First and foremost this is a beautifully illustrated book. All of the butterfly species recorded in Cyprus are illustrated by colour photographs, often with most parts of their life-cycle. It is a lavish "coffee-table book". However, it also attempts to go beyond this and provide a general introduction to butterflies for beginners and an accurate scientific record for those with a greater enthusiasm.

The book is divided into three sections. First there is an introduction, with details of the geography, climate and vegetation of Cyprus, followed by a general introduction to butterflies. It is this latter part that is rather superficial and occasionally inaccurate. However, this can be forgiven due to the quality of the photographs. (Perhaps the author would consider a second book on the insects of Cyprus?) There are mouth-watering sets of life-cycle photographs and even the section o butterfly enemies is well illustrated!

Section A covers the butterflies themselves in taxonomic order. The descriptions are rather brief but informative. A useful inclusion is a set of life-size photographs for each common species. There is then a fascinating discussion about the species of Cyprus (surprisingly, there are only 53!). Cyprus does have three endemic species and six endemic subspecies, all of which are nicely illustrated.

Section B features all the species as set specimens underside and upperside for both sexes. The combination of set specimens and photographs of live butterflies should both make identification easier. Though this is not the sort of book you would want to take into the field!

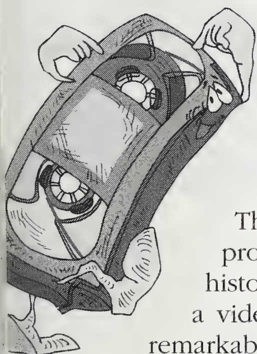
Comparing the distribution maps (provided by Eddie John – who wrote the AES booklet on Cyprus butterflies) to Butterfly Conservation's

Millennium Atlas for Britain, the woeful under-recording of Cyprus' fauna is clearly shown. Much is still to be learnt, and you can feel thE author's excitement on discovering breeding populations of *Libythea celtis*, Nettle-tree Butterfly.

In short, if you are interested in the butterflies of the Mediterranean, you should order this book immediately. Particularly when you consider all this is available for less than £30! The endemics are not illustrated in Tolman and Lewington's Collins Field Guide to Butterflies of Britain and Europe, so if you are thinking of visiting Cyprus, this book is essential.

At present, details of UK distributors have not been finalised, but look out for them at the AES Exhibition and details will be available on Eddie John's website dedicated to Cyprus Butterflies: http://www.grayling.dircon.co.uk/index.html.

Phil Wilkins (7607)



The Natural History of the Isle of Portland

Running time: 140 minutes

Cost: £17.50p inc. P&P.

This digital video is a high-quality production, which provides a comprehensive introduction to the natural history of the Isle of Portland. As one would expect from a video that took three years to make, it contains some remarkable footage including an acrobatic Hobby catching a Large White Butterfly, and pictures of the fabulous Monarch Butterfly. The video takes you on a tour of the island through the seasons, exploring the various habitats around the island and the specialities that can be found at those sites as the seasons change. There is some fantastic footage of a whole range of insects, including six species of Hawk-moth, Glow-worms, Rose Chafer, Emperor Dragonfly, Portland Ribbon Wave, Lulworth Skipper, the endemic Cretaceus form of the Silver-studded Blue, and the rarely filmed Scaly Cricket. What a video!

The history of the island is discussed and shows how the island has changed in response to the considerable influence of man's activities. There is also a discussion which reveals the importance of the Chesil Beach and Fleet nature reserve as a site of national importance for many species of invertebrate, and a site of international importance for birds such as the Brent Goose.

There are over 250 species of Portland's flora and fauna shown on this video, and although it offers extensive footage of invertebrates, it is also thoroughly enjoyable for integrating these into the larger picture of Portland wildlife. There are species caught on film that can hardly be imagined, including some very beautiful birds such as the Golden Oriole, Wryneck, Rose-coloured Starlings, and Blyth's Pipit. There is also fascinating footage of Bottle-nosed Dolphins, Wall Lizards, Wasp Spider and Parrot Waxcap toadstools.

The video describes the importance of quarry, grassland, and scrubby undercliff habitats revealing some rare and attractive plants that they contain such as the strange Wasp Orchid, Hairy-fruited Cornsalad and Autumn Gentians. The list of flora and fauna could go on and on, but what this video ultimately reveals is very simple. Few people really appreciate the wealth of life that is associated with the Isle of Portland. This video goes a long way to revealing some of those secrets. Thoroughly enjoyable and thoroughly recommended, and if that wasn't enough, all profits from the video go to Portland Bird Observatory and Dorset Wildlife Trust to continue their good work.

To purchase a copy of this video, please send a cheque made payable to: 'PBO Bookshop' for £17.50 with your address details to: Portland Bird Observatory, The Lower Light, Portland, Dorset DT5 2JT.

Peter Sutton (7388)

HOW TO GET THERE

Y CAR

rom the M25. Exit at Junction 12 (M3) towards Sunbury.
xit the M3 at Junction 1 and take the A308 sign posted for Kempton Park.
ne racecourse is situated one mile on the left hand side.

Y TRAIN

wo services an hour are operated from London Waterloo to Sunbury
ation by South West Trains. Journey time is approximately 40 minutes.

or more information contact London Travel Information on 020 7222 1234

Bookings for trading and exhibit space can be made by e-mail at exhibition@theaes.org

The Bulletin
of the Amateur Entomologists' Society

Volume 62 • Number 449 August 2003

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The Bulletin

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Officers of the Society

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Photo: Peter Sutton

The cover of the *Bulletin* shows a pair of Wood White butterflies, *Leptidea sinapis*, engaged in a courtship display. This delicate and enchanting species, which was formerly well distributed in England and Wales, has become a considerable rarity after experiencing serious declines across its range during the last century. The courting butterflies, which are second brood adults, were discovered on an undercliff path between Branscombe and Beer Head in East Devon on the 5th August 2000. (The East Devon and South Somerset area is one of three remaining strongholds for this species in England.)

The **Bulletin**

of the Amateur Entomologists' Society

Volume 62 • Number 450 October 2003

Editorial

The October *Bulletin* means that the AES Exhibition is over for another year! I hope all members that attended had an enjoyable day.

There are a couple of important announcements to make with this *Bulletin*. The first relates to our legal duty to publish the Society's financial accounts. Due to an oversight during the changeover of editors of the *Bulletin*, we have not published these for the last two years! We apologise for this, and, in consequence, those two years of accounts are included with this issue of the *Bulletin*. Normal service will be resumed next year.

The second announcement relates to the Society's website. More information can be found in the Announcements, Requests and Replies section. The latest news is that it looks like the domain name www.theaes.org has been lost. As a society, the AES cannot afford to fight to regain it. Hence we have registered a new domain name www.amentsoc.org which will hopefully be up and running in the near future.

I would like to end this editorial with the customary plea for articles, which can be emailed to phil@bombus.freeserve.co.uk until the new AES e-mail address is working properly.

Phil Wilkins

Treasurer's Report for year ended 31 December 2001

This year was one of mixed fortunes for the finances of the Society, but I am pleased to report that the general fund has made a profit, albeit a small one, for the first time in several years. This was made possible by an increase in income from subscriptions, donations and the introduction of the Gift Aid system enabling us to reclaim income tax at the rate of 28% from members who are UK taxpayers and who have signed a Gift Aid Declaration. This can be found on the membership renewal forms, or one can be supplied separately for any member who has not previously completed one but wishes to do so now. Expenditure also generally decreased across the board. My hopes of a reasonable profit this year were dashed by the crash in investment values during the year, mostly due to the terrorist attacks in America in September. One note of caution, though, is that we are generally still dependent on income from investment to try to balance the income and expenditure annually.

The level of income from sales of publications was not sufficient this year to counteract the effect of the investment losses and the printing costs, and has resulted in a loss to the Publications Fund this year of approximately £1200. I expect the Publications Fund to return to making a profit next year.

Treasurer's Report for year ended 31 December 2002

Financially, 2002 proved to be another difficult year for the General Fund of the Society, mostly as a result of two different causes. The first of these, which is one no doubt affecting virtually every organisation in the country, has been the continued dramatic decline in investment values and returns. This had generally begun during the early part of 2001, but greatly increased after the terrorist attacks in America some 18 months ago. At present, these losses in capital values are only a "paper loss" since none have been sold, the intention being to wait until they eventually start to rise in value again. Returns from these investments, such as interest and dividends, are all somewhat down on pre 2001 levels. The result of these aspects has been not only a loss in value of a number of these investments, which affect the Crow and Hammond and Publications Funds, but it has also meant that The Society has not

been able to utilise this type of income to subsidise the annual subscriptions.

The other, more serious, aspect of the finances which has contributed to the loss this year is one which has caused the General Fund problems for a number of years now, namely the level of subscriptions when compared to the cost of providing the periodicals of The Society. Until some ten years ago, subscriptions had always been set at a level which covered the cost of providing these periodicals, but the Society has seen many improvements to these such as the inclusion of colour plates, *ICN* and *The Bug Club Magazine*, all important items in our striving to improve both our periodicals and the image of The Society. However, subscription levels have not risen in step with the increase in costs, being part-subsidised by investment income and also by utilising monies held in the General Fund, and by two transfers from the Crow and Hammond Fund. Council is at present undertaking an in-depth review of income and expenditure to try to alleviate this problem as far as is possible, but it is likely that an increase in subscription levels is inevitable. However, our subscription levels are still well below those of other similar publications and organisations.

Turning to the Publications Fund, a new Publications Agent has been appointed and has been undertaking an advertising campaign for the publications of The Society and liaising with the General Editor to try to increase publications sales and income accordingly. The Publications Fund made a profit this year of £1128, despite the downturn in investment values and income referred to earlier.

Piedmont Anomalous Blue (*Agrodiaetus humedasae*)

by Matthew Rowlings (9108)

29 Woodpath, Southsea, Portsmouth, Hampshire, PO5 3DX.

This is a species with a very restricted distribution. It is recorded only from the picturesque Cogne Valley, about 30 miles south of Mt Blanc in north west Italy. I visited the valley on a dull, wet, humid July morning. Butterfly collecting is banned in this valley, there being signs forbidding this activity. So, armed with a pair of binoculars, my video camera and a waterproof I headed off looking for this species. Sainfoin was abundant in patches, being the foodplant of the Anomalous Blues I felt I was in the right place. A fallen telescopic handle for a butterfly net further encouraged me that I was in the right place, although it's presence clearly indicated someone had been flouting the no netting rules. They may not have been collecting though. During a break in the cloud at a very likely looking spot amongst the bushes, orchards and meadows I spotted my first Piedmont Anomalous Blue. A nice male, probably just emerged. The banks were steep so my close focus binoculars proved essential. I found a total of ten individuals including four females. I searched the spikes of Sainfoin seeds for eggs but failed to find any. I was probably too early in the season for laying to have begun seriously. For information on this and the other *Agrodiaetus* species of Italy I recommend the booklet by Bolognesi (see reference below). It is a booklet on rearing but it contains information on flight times, the habits of each stage in the life cycle – a fascinating and informative work.

Other species found here included the Escher's Blue (*Agrodiaetus escheri*), Osiris Blue (*Cupido osiris*), a perfect and rather late Green Underside Blue (*Glaucopsyche alexis*), Great Sooty Satyr (*Satyrus ferula*) and Dusky Meadow Browns (*Hyponephele lycaon*).

Reference

Bolognes. 2000. *Rearing the Agrodiaetus of Italy*

Brimstone super male!

by M. A. Spencer (10316)

42a Gorleston Road, Branksome, Poole, Dorset BH12 1NW.

A strange observation of the Brimstone *Gonepteryx rhamni* (Linn.) was of a female making numerous excited investigations of the shrub *Eonymous fortunei* Emerald and gold. She would constantly flutter over the shrubs, landing on them, flying off and then returning, as if expecting some response from the plant. This first observation took place at West Parley during early February 2001, and to my eyes at least, this shrub looks just the same brilliant sulphur yellow as the male butterfly of this species. Was the female fooled into thinking she had found a giant super male? Indeed, does the female of this species pursue the male by visual means? To be honest I can't remember seeing much written on the normal mating/breeding behaviour of this species. Can someone put me right on this?

I would have thought that she might be seeking to lay eggs, but this would be very early for a female to have already mated surely.

If you think this was a one off, I'm sorry to tell you an almost identical observation was made around the same time by a friend in her garden at Wimborne, of a female Brimstone with a golden leaved *Euonymous*!

While on the subject of odd behaviour by female Brimstones, in early May 2000 I was amazed to watch one descend into a garden in the Talbot Woods area of Bournemouth and frantically oviposit five or six ova onto the young growing tips of a Sweet bay *Laurus nobilis*. I collected these eggs in the hope of them feeding on a new and more readily grown foodplant, but they all failed to even hatch (probably killed by chemical resins in the pungent leaves?).

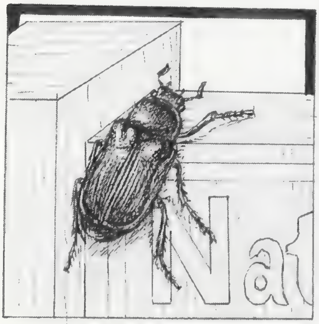
This error is more understandable, as Brimstones always seem to be far more numerous than their little known (or grown) foodplants, so they must be very desperate to off load their eggs.

Also this species seems to be very visual, as when laying eggs in my garden. (I grow Alder and Purging buckthorn deliberately for them alone.) They always seem to check out the young shoots of nearby privet (though they never lay on this, so it must taste wrong to their feet!) which to our eyes looks very similar. Yet another strange fact: the local female Brimstones never lay on Purging buckthorn, nor even check it out and it looks quite different to my eyes although the larvae can be fed on it.

Classic Entomological Sites – Pagham Harbour, West Sussex

by Sarah Patton

Pagham Harbour LNR, Selsey Road, Sidlesham, Chichester, West Sussex PO20 7NE.



The Site

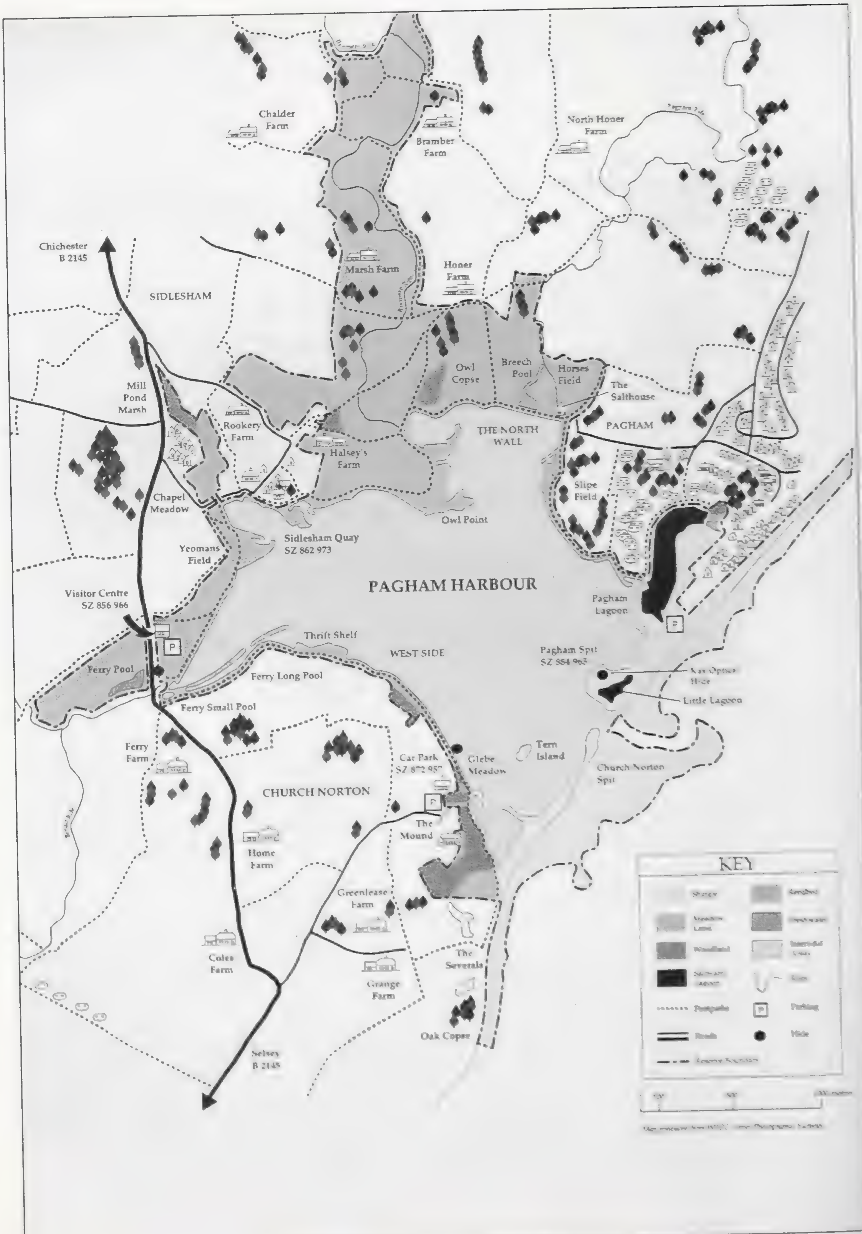
Pagham Harbour is a 1450 acre Local Nature Reserve situated on the Selsey Peninsular in West Sussex. Although probably best known for its bird interest, there are many important invertebrates. My enthusiasm for these groups has ensured that, over the last three years, much effort has gone into recording them. It is no exaggeration to say that hundreds of new species for the reserve have been discovered in this time.

Figure 1. General view of Pagham Harbour.

Figure 2. General view of Pagham Harbour.

Only about half of the reserve is the "harbour" itself – an area of tidal mudflats and saltmarsh. The rest comprises grazed grassland, vegetated shingle, reedbeds and a small amount of woodland. It is designated as a Site of Special Scientific Interest, a "Ramsar" site and a Special Protection Area. Despite these designations, there is pressure from ever-increasing numbers of visitors and the subtle encroachment of rising sea levels.

Most people start their visit, especially the first time, at the Visitor Centre at Sidlesham. This is situated on the B2145 Chichester-Selsey Road at grid reference SZ 857 966 and is open at weekends and during the week when volunteer stewards are available. Up-to-date sightings are posted in the window and the small shop sells identification guides, maps and hot drinks. Another popular access point is the Church Norton car park at SZ 872 957, although there are no facilities here and visitors are asked to respect the spaces reserved for church parking. On the east side of the harbour, there is a car park at Pagham Beach, SZ 884 965. This is the "touristy" side of the harbour and probably best avoided in August and on hot weekends if you are visiting to see wildlife!



Map of Pagham Harbour LNR.

Casual records

Butterflies and dragonflies are probably the two groups which most casual visitors to the reserve are likely to encounter. Unfortunately, the open nature of the reserve means that Pagham Harbour is not a particularly good site for either! Small numbers of White-letter Hairstreak *Strymonidia w-album* can sometimes be seen on the few English Elms that have escaped disease and Purple Hairstreaks *Neozephyrus quercus* frequent the stunted oaks which grow along the western edge of the harbour. Migrant butterflies can be prolific in good years with Painted Lady *Vanessa cardui*, Clouded Yellow *Colias croceus* and Red Admiral *Vanessa atalanta* occasionally joined in late autumn by a wandering Monarch *Danaus plexippus*.

A visitor in May and June could be lucky enough to see Hairy Dragonfly *Brachytron pratense* which are present on the freshwater rifes which feed into the harbour. There are a few records of the migrant Yellow-winged Darter *Sympetrum flaveolum* but the only other species of note is the Ruddy Darter *S. sanguineum* which is fairly common in some years. Probably the most prolific species is the Migrant Hawker *Aeshna mixta* which can be found anywhere on the reserve.

Saltmarsh species

The saltmarsh might appear inhospitable to invertebrates but a specialist fauna is present. The larvae of the plume moth *Agdistis bennetii* (Figure 3) feed on Sea Lavender *Limonium vulgare* and those of the Star-wort Shark *Cucullia asteris* are to be found on Sea Aster *Aster tripolium*. The cranefly *Limonia bezzi* was recorded on the reserve during the 1970s and has been refound in 2003. There are few sites for this Red Data Book (RDB) fly. It is associated with coastal lagoon and intertidal gravel with *Enteromorpha* alga, which is where the larvae probably develop. The adult found this spring was feeding on Sea Kale *Crambe maritima* flowers which it was able to access with its long mouth-parts. The larvae of the RDB horse-fly *Atylotus latistriatus*, which has been recorded in several areas of the reserve, have been found within saltmarsh substrate and in seaweed on the driftline. The Long-legged fly *Dolichopus signifer* is associated with coastal seepages and saltmarshes. A male was swept from grasses in Sidlesham in June 2001 and is apparently a new species for West Sussex. *Melieria picta* is a picture-winged fly found on saltmarsh. It is very local and mainly confined to SE England, especially the Thames

Figure 3. The unusual resting posture of the Plume Moth *Agdistis bennetii*

estuary and the Isle of Wight. A male was found at the edge of the Mill Pond Marsh reed in June 2001 which was a new vice-county (VC) record. The wood-boring beetle *Pselactus spadix* has been found in old groyne timber on the Pagham side of the harbour.

The larvae of the local weevil *Mecinus collaris* develop in galls in the flowering stems of Sea Plantain *Plantago maritima*. There are just two sites for this species within VC13 (West Sussex). Other weevils associated with saltmarsh plants are *Polydrusus pulchellus* (Sea Wormwood *Artemisia maritima*), *Sibinia arenariae* (spurreys *Spergularia* sp.) and *Trichosirocalus dawsoni* (Sea Plantain *Plantago maritima*).

The Mouse-eared Snail *Ovatella myosotis* is a local species in Sussex which occurs beneath vegetation and tidal debris at the upper tidal limits of saltmarshes. More common is the Laver Spire Shell *Hydrobia ulvae* which is found on muddy surfaces in saltmarsh and mudflats.

Vegetated shingle

There is splendid vegetated shingle on both sides of the entrance to the harbour. On the Pagham (NE) side, the shingle is stable and richly vegetated in front of the ribbon-development of houses, although it is threatened by the spread of alien species. The escaped broom sp. on the beach is very popular with the colourful black and yellow bug *Capsodes sulcatus* which is found all over the reserve. We are right on the eastern edge of its distribution here at Pagham. On the Church Norton (SW) side of the entrance, the shingle is replenished annually by the Environment Agency but there is a sheltered, stable ledge on the landward side. Perhaps the most famous invertebrate in this habitat is the Toadflax Brocade *Calophasia lunula* moth (Figure 4), the larvae of which feed on both the native Common Toadflax *Linaria vulgaris* and the introduced Purple Toadflax *L. purpurea*. Specialised pyralid moths include *Dolicharthria punctalis*, *Synaphe punctalis*, *Pyrausta despicata*, *Pediasia contaminella* and *P. aridella*. Grey Bush Cricket *Platycleis albopunctata* (Figure 5) is also present. Parts of the shore margin

support a strong population of the Red Data Book snail *Truncatella subcylindrica* together with the local species *Leucopytia bidentata*. These are the only known populations of these species in West Sussex.

Figure 4. The caterpillar of the Toadflax Brocade, *Calophasia lunula*.

'igure 5. The Grey Bush Cricket, *Platyleis albopunctata*.

Reed beds and wetlands

The small reed beds scattered around the site are one of the best habitats for scarce moths. The first colony of Flame Wainscot *Senta flammea* in the vice-county was located on the reserve in 2000 and another has been discovered in 2003. Reed Dagger *Simyra albovenosa* has also been found this year and it appears that this species may be getting a foothold in West Sussex. The wainscots are well represented with Mere *Photedes fluxa*, Obscure *Mythimna obsoleta* and Silky *Chilodes maritimus* all present. The attractive Rosy Wave *Scopula emutaria* is found in coastal reed beds. The specialist micro-moths include *Schoenobius gigantella*, the larvae of which feed inside the young shoots of reed and then float from stem to stem on a raft of food, *Chilo phragmitella* and *Calamotropha paludella*. The gall-forming *Lipara* flies (Figure 6) are present, the commonest being *Lipara lucens*.

Figure 6. The gall of the fly, *Lipara lucens*.

Notable water beetles include *Rhantus suturalis*, *Hydraena testacea* and *Ochthebius auriculatus*.

Grass and scrub areas

A walk through the grassy areas around the edge of the harbour in the autumn reveals the webs of Wasp Spiders *Argiope bruennichi* (Figure 7) which sometimes catch the Long-winged Cone-head crickets *Conocephalus discolor* which are common in the area. Until recently it was not unusual to see the day-flying moth *Sitochroa palealis* which feeds on Wild Carrot *Daucus carota* but the temporary(?) colony which

Figure 7. The Wasp spider, *Argiope bruennichi*.

colourful Cream-spot Tiger *Arctia villica britannica* which can often be seen resting, newly-emerged, on long grass stems.

The swathes of gorse along the west side of the harbour are home to a colony of the scarce pyralid moth *Pempelia genistella*. The adults can often be difficult to record but the larvae are easily spotted feeding communally in webs on sunny days. During April and May clouds of the day-flying tortrix *Cydia succedana* can be seen flying along the gorse bushes.

The oaks just beyond the beach at Church Norton appear to host a colony of the pyrale *Acrobasis tumidana* which are sometimes recorded, but in small numbers.

Hymenoptera

Areas on the west side of the harbour are excellent for aculeates – stinging bees and wasps. There are huge colonies of the Yellow-legged. Mining Bee *Andrena flavipes* along with it's kleptoparasite *Nomada fucata*. Areas have been deliberately kept clear of vegetation to provide them with suitable habitat for burrowing. Eroded 'cliffs' support a colony of the Hairy-footed Flower Bee *Anthophora plumpies* and also *Melecta albifrons* which is a cuckoo bee in the nests of *Anthophora spp.* (Figure 8) restricted to southern Britain. The Bee Wolf *Philanthus triangulum* was discovered in 2001 although it seems that this once-rare species of solitary wasp is now locally common at some sites in southern England. The main nest burrow of this amazing species may be up to 1m in length with short, lateral burrows at the end. The main prey item is, as the name suggests, the Honey Bee. For me, the most exciting 'discovery' was finding that the Large Velvet Ant *Mutilla europaea* (Figure 9) was still present on the reserve after an absence of records for many years.

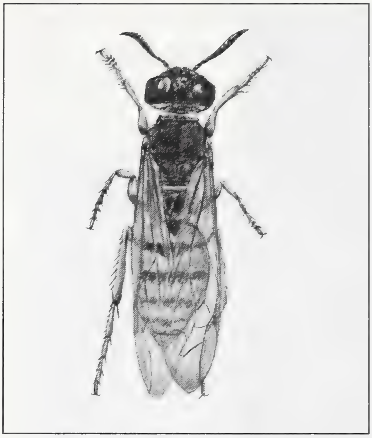


Figure 8. The impressive Bee Wolf, *Philanthus triangulum*.

Figure 9. The female Velvet Ant, *Mutilla europaea*.

Beetles

It is difficult to pick a selection of beetles to highlight in this section but, rather than choose the rarest I have selected some with interesting anecdotes! *Telmatophilus schoenherri* is a fungus beetle found on freshwater margins and is associated with reedmace *Typha*. It was found frequenting Lesser Bulrush *T. angustifolia* in a disused pond-dipping pool. The leaf beetle *Bruchidius varius* was first discovered in the British Isles at Ditchling Beacon in East Sussex in 1994. It is almost certainly a recent colonist which is likely to spread. It has been recorded from several sites in SE England and was found in the North Wall area of the reserve in 2002. The larvae develop in the flower heads of clover *Trifolium sp*. The longhorn beetle *Gracilia minuta* (Figure 10) was formerly widespread in England and Wales but is now only recorded between Hampshire and Kent. The record of a female near Ferry Small Pool in June 2001 was only the second VC record.

Figure 10. The Small Longhorn Beetle, *Gracilia minuta* – only 3-7mm long.

The notable flea beetle *Longitarsus dorsalis* invades the visitor centre during the autumn with many hundreds on the outside (and inside!) of the building.

Recording can often turn up surprises and the discovery of the Bombardier Beetle *Brachinus crepitans* in 2002 was unexpected as there is no chalky habitat on the reserve. (*Editor's note: see p158 in the previous Bulletin for a photo of this species.*) However, the area in which it was found was close to the old Chichester-Selsey train route which was built on a raised bank made out of chalk! This was the first record for the vice county.

Molluscs

The Spire Snail *Hydrobia ventrosa* is a local species found in low-salinity non-tidal pools, usually submerged on aquatic vegetation. The Marsh Whorl Snail *Vertigo antivertigo* and the Striated Whorl Snail *V. substriata* are indicative of natural or semi-natural fens and marshy meadows and have been found in the north fields of the reserve. The Smooth Grass Snail *Vallonia pulchella* is a species typically found in moist, base-rich grassland in sunny situations. These three are local species in Sussex.

Freshwater species include the Flat Valve Snail *Valvata cristata*, Jenkin's Spire Snail *Potamopyrygus antipodarum* which is an introduced species, the Shining Pea Mussel *Pisidium nitidum* and the Lake Orb Mussel *Musculium lacustre* which is rather local in Sussex.

Terrestrial snails include the Smooth Grass Snail *Vallonia pulchella* which is typically found in base-rich grassland and local in Sussex, the Prickly Snail *Acanthinula aculeata* which is a species typical of leaf litter in woodland, the Milky Crystal Snail *Vitrea contracta* and the Wrinkled Snail *Candidula intersecta.*

Moths

Saving the best until last! I am passionate about moths although, unfortunately, do not get to record on the reserve as much as I would like. Survey work has been undertaken, in various habitats, since 2001 and the results have been fantastic.

However, to start with historical records, the colonising Channel Islands Pug *Eupithecia ultimaria* was found on the reserve in 1995 and has been regular since. It was first found in southern England in 1989. Sadly the attractive pyralid moth *Cynaeda dentalis* is no longer found on the reserve. Last seen in about 1900, this species feeds on Viper's Bugloss *Echium vulgare* and is still found in East Sussex.

Survey work has turned up a single specimen of the pyrale *Gymnancyla canella* a species not recorded on the reserve since about

1900. It's origin can only be guessed at as the foodplant, Prickly Saltwort *Salsola kali* has not been recorded on the reserve. Not part of a survey, but a Tissue *Triphosa dubitata* was found under a desk in the Visitor Centre in spring 2003 which was the first vice county record since 1985.

Last winter I collected a couple of nests from the bird boxes when we cleaned them out. They were kept in plastic bags in our workshop until the spring when they produced an amazing number of moths – eight Skin Moths *Monopis laevigella*, 68 Bee Moths *Aphomia sociella* and 88 White-shouldered House Moths *Endrosis sarcitrella*. The micro moth *Depressaria daucella* overwinters in our workshop, along with the larvae of the Cream-spot Tiger.

The introduced tortrix *Crocidosema plebejana* was first found on the reserve in 2002 and seems to be resident here now. There are plenty of mallows on the reserve, including Tree Mallow *Lavatera arborea*, to act as foodplants. The pyrale *Elegia similella* was found at Church Norton this year and is presumably colonising the small area of oaks there. This species seems to be spreading it's range through West Sussex.

One of the discoveries made during survey work in 2002 was the plume moth *Stenoptilia zophodactylus* which feeds on Centaury *Centaurium erythraea*. There seems to be a strong colony in the Church Norton area with a larva found this year and adult moths found during the day as well as atrracted to MV light.

Small micro-moths

In July 2001 the gelechiid *Psamathrocrita argentella* was found at Pagham Spit. This moth is possibly associated with Sea Couch *Elytrigia atherica* and was first found in South Hampshire in 1937. After the 1930s it was not seen again until 1973 when it was found on the Isle of Wight, it was then refound in Hampshire in 1978 and discovered in West Sussex in 1992.

Scrobipalpa ocellatella is a notable gelechiid which feeds on Sea Beet *Beta vulgaris* spp. *maritima* and is found at Church Norton.

Migrant moths

Our coastal location is ideal for migrant moths and over the years a number of exciting species have been recorded. Great Brocade *Eurois occulta* was trapped at Church Norton in 1978, single Flame Brocade *Trigonophora flammea* were caught in 1985 and 1990 and a Red-headed Chestnut *Conistra erythrocephala* came to m.v. light on the

beach at Church Norton on 29th October 1991. This has been the only West Sussex record since this species became extinct in 1875. Ni Moth *Trichoplusia ni* have been seen in 1985 and 1996, when three were recorded. A Clifden Nonpareil *Catocala fraxini* was trapped at Church Norton in 1990. Two specimens of the attractive migrant pyrale *Palpita vitrealis* were identified at Church Norton in 1991.

The pyrale *Ancylosis oblitella* is recorded as an immigrant and probable resident. Four were found near Pagham Village in 1996 and a single came to light at Church Norton on 20th September 2003.

A moth night at Church Norton

Sixteen m.v. lights were set up by a group of people from Sussex and Surrey on the evening of 20th September 2003. We were, naturally, hoping for some migrants but also looking forward to a selection of autumnal moths. Fairly early in the evening a "trap round" stopped at my light on the beach where I discovered a small, well-marked pyrale which turned out to be *Ancylosis oblitella.* Inside the trap there was a Red Admiral *Vanessa atalanta* which may have been a migrant, but not really what I was expecting and also a strangely marked *Spodoptera* which was resting with its wings flat. It was quickly tubed and shown to the other entomologists and, by the light of torches, it seemed to be a candidate for *cilium.* Unfortunately, in the cold light of day this turned out not to be as the hindwings had traces of black veins present. Several more Small Mottled Willow *S. exigua* were taken during the night. Mullein Waves *Scopula marginepunctata* were seen at every trap and were of the pale form usually found on the reserve. Seasonal moths started to be found with a glorious Black Rustic *Aporophyla nigra*, several Brindled Green *Dryobotodes eremita* and a Sallow *Xanthia icteritia.*

A mobile phone call alerted us that a Striped Hawk-moth *Hyles livornica* had been seen at another light – a bright fresh individual. By the end of the night a second had arrived along with a male Four-spotted Footman *Lithosia quadra.*

Rumour of a Channel Islands Pug *Eupithecia ultimaria* was confirmed but unfortunately the moth had moved on before everyone could see it. Better-behaved was a White-speck *Mythimna unipuncta* which sat patiently in one trap and was joined by others before the night was out. Vestals *Rhodometra sacraria* weren't seen by everyone but Rush Veneers *Nomophila noctuella* were common and there were several Dark Sword-grass *Agrotis ipsilon.* Normally abundant, only a few of the Light-brown Apple Moth *Epiphyas postvittana* were seen and

newcomers to mothing were told about their introduction from Australia on plants. A few more autumn specialities were seen with a Canary-shouldered Thorn *Ennomos alniaria* and a stunning L-album Wainscot *Mythimna l-album*. Four Copper Underwings *Amphipyra pyramidea* were examined but all were of that species. A Gold Spot *Plusia festucae* proved popular, especially with those for whom it was a new species.

Visiting entomologists are always most welcome but, of course, with the proviso that your records are submitted to the reserve (FAO The Warden, Pagham Harbour LNR, Selsey Road, Sidlesham, Chichester, West Sussex, PO20 7NE). Please also note that we do need to know in advance if people plan to run MV traps, to avoid conflict with our neighbours and/or surveyors.

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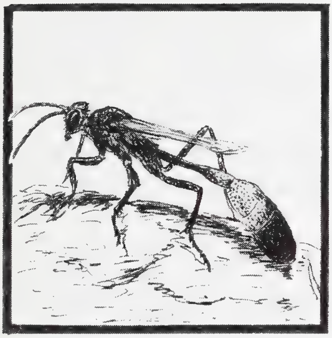
In this article, photographs were by Sarah Patton, watercolours by Phil Wilkins



ANNOUNCEMENTS, REQUESTS AND REPLIES

The AES Website – an apology

Those who have searched for the AES website over the last few months will have found this a fruitless task! Sadly, our Internet Service Provider (ISP) went into liquidation. When the site was initially set up, the contact details somehow became the ISP contact details. So they informed themselves that they were going bust! Unfortunately, once the company no longer existed, we were unable to retrieve the domain-name www.theaes.org as this was registered for the AES in the name of our ISP! However, we hope to have the situation rectified shortly.

As a short term measure, members can contact one of the *Bulletin* editors via the email phil@bombus.freeserve.co.uk. This is currently the preferred format for receiving *Bulletin* articles and short notes for inclusion in this section.

Announcement: Planning a National Macro-Moth Recording Scheme

NATIONAL MACRO MOTH RECORDING SCHEME

There is more interest in moths now than at any other time and this interest increases with every year. A vast amount of recording effort takes place across Britain and Ireland, and new discoveries continue to be made. Some once widespread species seem to have almost disappeared, other familiar species show worrying declines in abundance, whilst immigration seems to bring ever increasing numbers of vagrant and potential colonist species from the Continent. The present network of county recorders does an admirable job in collating data at county

level, but it is ironic that at a time when interest in moths has never been greater there is no national recording scheme to harness and present these data on a wider scale.

Butterfly Conservation is now conducting a planning, consultation and development project that will hopefully lead to the eventual establishment of a new national recording scheme for all macro-moth species. Adrian Spalding and Mark Tunmore are undertaking the bulk of this planning phase, in close association with BC staff. The planning phase is supported financially by the Heritage Lottery Fund, English Nature, the British Entomological and Natural History Society, RSPB and Biodiversity Challenge with the backing of many other partners.

The potential benefits from a co-ordinated national recording scheme are almost limitless. It would provide data to identify and promote conservation priorities, influence planning decisions, inform government policy and contribute to scientific research. It could also lead to the publication of a national distribution atlas in time.

In order for us to develop the type of scheme to which today's moth recorders would like to contribute, and to increase the chances of obtaining the necessary funding, it is vital that those interested in moth recording let us know their views before March 2004. The easiest way to do this is by completing the online questionnaire, viewable at www.mothrecording.org.uk. Alternatively, the same questionnaire is available on a colour leaflet, copies of which are obtainable from the address below upon receipt of a large SAE (A5 size). In the coming months we will be contacting local moth groups and attending events to canvas opinion. The following regional conferences will also take place, at which we look forward to meeting moth recorders, talking more about the scheme and hearing your views. There will also be guest speakers.

ENGLAND: Warwick University, Saturday 10 January 2004 (10.00–16.30hours).

SCOTLAND: Scottish Natural Heritage (SNH): Battleby Centre, Perth, Saturday 13 December 2003 (10.00–16.30hours).

WALES: To be announced. Details available on the website.

Booking is essential for these events as numbers are limited and there will be free lunch and refreshments. E-mail bookings@mothrecording.org.uk or write to the address below.

NMRS (planning), Norfolk House, 16–17 Lemon Street, Truro, TR1 2LS
e-mail contact@mothrecording.org.uk
website: www.mothrecording.org.uk

Annual Wrappers for the *Bulletin*

An announcement was made regarding the potential production of *Bulletin* "wrappers" in the June *Bulletin*. Response has been minimal so far, so such wrappers will not be produced in the near future, unless more members contact the society. Thank you to those who have taken the time to reply.

Requests and Ideas

The editors received a detailed letter from Roger Hayward FRES (2769) in March in response to the "Announcements, Requests and Replies" section of the *Bulletin*. It has not been published until now, since some of it referred to the "Entomologists' Directory" undergoing editorship at the time. However, since that publication is on hold at the moment, it is pertinent to summarise Roger's thoughts in the *Bulletin*.

Killing agents

Roger would like up to date advice on killing moths without damage to them. He laments the decline of the cyanide bottle, adding that it was quick, reliable and easy to use, remaining effective for years. Used correctly there should be minimal risk to human health. By comparison, modern killing fluids are "inconvenient, volatile and unreliable". He also complains about the number of times a bottle needs to be recharged with newer fluids. Larger moths are a problem – Roger has had them "come to" on the setting board after half an hour in a freshly charged bottle. Is there a safe time for larger species such as the Hawk-moths? Both cyanide and oxalic acid are almost impossible to obtain from chemists. Freezing can be used to kill moths, but is obviously impracticable in the field. Some moths, such as Prominents cannot be transported live from the field without them damaging themselves. Roger requests details on good, currently available killing agents and where to obtain them.

Reference collections

Roger requests advice on the best method of stripping cork lining from cabinet drawers or store boxes and how is plastazote best secured in place? Degreasing agents are a problem. How are they obtained and what is recommended? Some agents are mentioned in the old AES Leaflet no. 28, but Bernard Skinner recommends toluene. It dries more slowly and has less binding effect on fringes and body hair. This can be obtained by advance order from D, J and D. Henshaw at the AES Exhibition, but that is only once a year. Otherwise a trip to Essex is

necessary. Are there any likely sources of degreasing agents around the country? Early AES publications recommend carbon tetrachloride amongst others. Roger has used a "dry cleaning fluid" from the local dry cleaners, though the specimens dried out with a whitish bloom on them, needing removal. He suggests a degreasing bank, as used by the old New Forest collectors (possibly using trichloroethylene). The "bank" comprised of four 7-pound glass sweet jars, each with a cork-lined rod attached to the lid onto which the specimens for treatment would be pinned. After a few days in the first jar, the batch of specimens would be progressively moved down the line into cleaner agent. A point would come when the contents of the first jar would need to be replaced. It would then become no. 4 and no. 2 would become no. 1 and so on. This apparently excellent system needs the equivalent of several gallons of agent to start it off, and then a gallon or so periodically to keep it going. Where are there likely to be such quantities of suitable agents obtainable locally?

Verdigris

Many collections contain irreplaceable specimens on brass pins. Verdigris can cause them literally to explode. How should such specimens be treated and restored?

Arrangement of specimens

Rogers final request regarding moths is how specimens should be arranged when space is tight. Roger tries to show males and females separately, but this requires the full range of variation to be shown for both sexes. This can limit the range of variation that can be shown. What is the scientifically preferred solution for small amateur collections?

Thoughts on "Announcements" and "Wants and Exchanges List"

Roger feels that one of the great failings of the AES is the lack of a correspondence section. One idea is a directory of good "entomologist-friendly" hotels in interesting areas. Such hotels should be comfortable and welcome moth traps and tolerate late-night returns from field trips. This is certainly an idea for inclusion in the "Entomologists' Directory". As mentioned earlier, this publication is currently on hold due to lack of interest and cooperation from traders, etc. To be successful and useful, it must be as comprehensive as possible, so if you know of any traders that should be included, please encourage them to contact the Society.

Finally, Roger suggests that the *Wants and Exchanges List* should include sections to enable and encourage people to dispose of surplus stock from interesting areas to other collectors. A sort of entomologists'

cooperative could mean that fewer specimens are taken in the future. This last point is down to members to advertise.

Well there it is. The gauntlet is down. Does anyone feel they can help on any of the questions? Does anyone feel able to produce a new AES Leaflet on the matter?

Editor's Note: Mike Dawson suggests Fuller's Earth as the best de-greasing agent.

Convolvulus Hawk Moths in 2003

The Society has received a few notes on the number of reports of Convolvulus Hawk Moths *Agrius convolvuli* in good numbers during the summer of 2003.

Chris Orpin (5736) of Kingham, Oxon had his fourth sighting of the summer of a Hummingbird Hawk Moth *Macroglossum stellatarum* feeding from *Verbena bonarsis* as well as large numbers of Silver Y *Autographa gamma*. Later that evening whilst looking for hedgehogs he noticed a large moth "zooming" around the garden. This proved to be *A. convolvuli* and it and a second, smaller, individual visited *Nicotiana* flowers. Chris has seen these Hawk Moths in Zambia and Zimbabwe but was amazed to see two in one evening in the UK!

Barry Chatfield (11789) of Marden, Kent received a box containing four *A. convolvuli* from a neighbour on 24th August. They had been trapped in a polythene growing tunnel at a local nursery. All were in poor condition, having been struggling to escape for some time. Only one was still alive, laying three eggs before it too died. Barry has not seen any of this species since 1952. 1950 was the last time he had observed more than a solitary specimen, when several were to be seen nectaring at clumps of *Nicotiana*.

This migrant species does seem to have had a good year in 2003. The editor (Phil Wilkins) has had a couple in his trap in Tunstall, East Suffolk.

Reply: An unusually large wasps' nest

by B. G. Chatfield (11789)

6 Sovereigns Way, Marden, Kent, TN12 9QF.

Further to the article in the previous AES *Bulletin* (Wilcox, 2003), a photograph is presented taken c1948. It shows a wasps nest extracted

from an electricity transformer housing in Hawkhurst. Kent. I am holding the nest to be measured – over a metre high and 50cm across. It had been an exceptionally hot summer.

Reference

Wilcox, G (2003) An Unusually Large Wasps' Nest. *Bulletin of the Amateur Entomologists' Society*. 62 (449) : 135-6.

Figure 1. Barry Chatfield with a large wasps' nest in 1948.

The Lily Beetle now recorded in Staffordshire and Cheshire

by Jan Koryszko (6089)

3 Dudley Place, Meir, Stoke-on-Trent, Staffordshire, ST3 7AY.

The first reference in the *Bulletin* to this beetle was the front cover of Vol 59, number 429, April 2000 (*This was the adult beetle, the eggs were on the cover of August 2000 and larvae on December 2000* Bulletins, *Ed*). The beetle appeared again in the December 2002 *Bulletin* in an article by David Keen (2002).

I now have records from Staffordshire and Cheshire. The first Staffordshire record of *Lilioceris lilii* (Scopoli) came from a garden in Tixall in 1999, recorded by Jonathan Webb (ex-Biodiversity Officer for the Staffordshire Wildlife Trust). The second and third records for the county came from myself. One single example was in my sister's house, on the lounge wall. Fresh flowers were in the house, so the beetle may have been transported into the house on these. This was on 27th April 2003, at the Meir. Then, on a shopping visit to Longton town centre, Stoke-on-Trent, I noticed around a dozen of these handsome beetles on potted lilies outside a fruit and vegetable shop. I managed to put four of these beetles into a container and left the rest. I did not have the heart to tell the shop-keeper that his potted lilies were being eaten away, fearing he would kill all these beautiful creatures. This was on 21st June 2003. I noticed when handling these beetles that they squeaked quite loudly.

I also received records from Cheshire, from Cynthia Berry in her garden at Stockport. She has found them for two years now, 2002-2003. No doubt this beetle is spreading around the country on flowers for sale and potted plants. All of my captured Lily Beetles are now in the collection of the Potteries Museum and Art Gallery, Hanley, Stoke-on-Trent.

I would like to thank Mr Don Steward, Keeper of Natural History at the Museum, and Mr Craig Slawson, BSc (Hons), Staffordshire Ecological Records Officer, for their help. It would be interesting to know how far this species has spread so far.

Reference

Keen, D. (2002) The Lily Beetle reaches Banbury. *Bull. Amat. Ent. Soc.*, 61, (No. 445), p241.

Book Review

A Butterfly Notebook

by Douglas Hammersley. (The Book Guild, Lewes. 2003) 140pp. 304 illustrations. Hardbound (ISBN 1 85776 722 5) £25

Anyone who appreciates the artistry of "Benningfield's Butterflies" or the precision of Richard Lewington's work, will be delighted with Doug Hammersley's illustrations, published under the title of "A Butterfly Notebook". He has captured grace of movement in addition to natural beauty, with a nice blend of scientific accuracy and art. To complement the paintings, Doug has written interesting and amusing accounts of his observations, describing the images of courtship, basking and feeding shown on the facing pages, and offering anecdotes that reflect changes in distribution and scarcity over the years.

A skilled medical illustrator by profession, and keen naturalist in retirement, the author has created a "notebook" of the butterflies of his aquaintance; most of the British species, with a smattering of attractive Continentals to add a little spice. Each picture is accompanied by his note of where and when, from Northumberland to his familiar West Harling Forest, Norfolk, and with occasional forays to the Pyrenees and the Adriatic. As the illustrations are so much larger than life, he includes one lifesize image on each page as a point of reference. In some cases, the larger pictures serve very nicely to assist with identification, and to highlight the points of difference between two similar species. Reading his account of the features separating Small and Essex Skippers leaves a clearer understanding than many of the field guides, for example. The volume is nicely produced, and the choice of paper has catered well for the reproduction of texture and fine brush-work, without generating the reflection that often spoils glossy photographs. There is only one photograph, and that is a whimsical portrait inside the dust cover, capturing the author in a moment of repose.

So this is neither a comprehensive work of reference, nor a superficial coffee table book. It falls nicely into the niche of what many lepidopterists would like to find in their Christmas stocking; a book to read and re-read, images to view with pleasure. I expect it to become one of my favourites.

Rob Parker

CD-Rom Review

A Revised History of the Butterflies and Moths of Sussex
by Colin R. Pratt, published by Brighton and Hove Council through The Booth Museum of Natural History. An update on CD Rom, the original being a hardbacked book. £33.

Publications regarding butterflies, moths and sometimes other orders from specific counties are becoming more common, which, in these days of concern over our generally decreasing fauna, is no bad thing.

This publication deals with the butterflies and moths of Sussex from both historical and modern records, together with the history of collecting in Sussex and the changing countryside.

In all, there are 15 chapters covering every aspect of the Lepidoptera of Sussex, commencing with the history of the main habitats in the county. These include downland, woodland, sand dunes, wetlands, shingle beaches and heathland. Each of these is dealt with in depth so that the reader can see how the distribution of each type of habitat has altered over the years from a general point of view; numerous sites, some quite famous entomologically, are also covered. The use of photographs and maps helps to show how they have changed.

Next follows a brief history of entomology in Sussex including outlines of the lives of major Sussex entomologists, the increase and decline of dealers based in the county and "the history of organised interest". Societies and organisations, both current and historical are mentioned.

The main part of this CD obviously deals with the history and current status of all the known Sussex Lepidoptera, including residents, regular migrants, rare vagrants, introductions and accidental releases, where known. Even species only occurring in the county once are covered, as are a few that were fraudulently reported as being found in Sussex (or in Britain as a whole) by one or two disreputable dealers many years ago. A number of regional atlases released in the past have proved to be somewhat lacking in distribution maps, leaving the reader feeling that more could or should have been included. That is certainly not the case here. Maps are included for every species covered except for those which have occurred here only once or twice. Indeed, numerous

species have the benefit of several distribution maps, each covering different periods of time. This makes it easier to see how the distribution has altered over the years. The history of each species, including major variations and aberrations, is given in depth and the reasons for their decline or increase discussed.

The CD concludes with a summary and analysis of Sussex habitat, lepidopterology and the species, lists of foodplants, sources of information, illustrations and English/scientific names.

In all, this undoubtedly has to be the most in-depth review of any order of invertebrates of any county in the United Kingdom to date, from both a modern and historical point of view. Some may find the cost prohibitive for a county guide, but I certainly would recommend it to anyone interested in the Lepidoptera of Sussex. For this purpose, it is well worth the price.

My only regrets are that, firstly, as a CD Rom, I could not casually read it "over the breakfast table" and, secondly, the photographs of the aberrations included were in black and white. However, I understand that the photographs are of part of a famous Sussex collector's collection which is no longer in existence and so colour photographs cannot now be taken of them.

Peter May

From the Archives: Beetle Collecting in the Autumn and Winter

by Geo. B. Walsh from Vol. 2 no. 21 (October 1937)

Editor's note: I have had numerous requests to include in the *Bulletin* hints and tips on searching for and collecting insects ("like those that appeared in the *Bulletin* in former years"). In response, I have included this article from the early days of the Society. I hope that it encourages members to send in their own tips to pass on to the beginners of the current century. Failing this, further archive articles can be published, if this feature proves popular.

This article is reproduced directly from the original, with only some corrections of spelling mistakes. Some ideas may be less applicable now, 66 years later, but most should be open to adaptation!

George Walsh was a coleopterist active in the north of England during much of the mid to late twentieth century. He was one of the original editors of the first AES Coleopterist's Handbook.

The coleopterist, unlike the majority of entomologists can be just as busy collecting in the autumn and winter as at any other time of the year.

The water-net should be used whenever opportunity serves, care being taken to work well under the banks, among the water-weeds and into the mud. The genus *Haliplus* is most in evidence during the winter, and species such as *Hydroporus oblongus* are best obtained in the early spring.

It should be remembered that different types of locality will yield different species of aquatic coleoptera, and so search should be made in ponds, slow-running streams, quick-running streams with or without a gravely bottom, and peaty pools. I have had good results in October by working the moss in and below waterfalls, species such as *Quedius auricomus, Stenus guynemeri* and *Dianous coerulescens* favouring such localities.

Thick moss in other localities often well repays search. In November I find *Mniophila muscorum* and *Orobitis cyaneus* in thick tufts of *Mnium hornum* growing by the roadside, and when the *Sphagnum* is drying in the spring, species of *Lesteva* can be found. These can be brought home in sacks, but they form wet and heavy loads, even in a car; and I find it better to pull them to pieces in the field over a rubber sheet, reject the coarser material, and bring the rest home for examination on a meat-dish.

Haystacks in different localities will give a host of common things with an occasional rarity to lend zest to the search. The material required is the damp fine material at the base, not the dry hay. The best stack that I ever examined was one that had been standing derelict for some years, and was going mouldy at the bottom, some parts being quite warm due to chemical change. This repaid examination over several winters, until at last cattle got to it and ate it all.

The turning over of stones in suitable places is often profitable, on our northern moors species such as *Bradycellus collaris, Pterostichus adstrictus, Calathus erratus* and *Carabus arvensis* being found. On bare patches there is often a felted growth of algae, and if this is turned over, species such as *Bembidion mannerheimi, B. nigricorne, Trichocellus cognatus* and *Bradycellus similes* are quite common with us; the same species with others such as *Carabus nitens* and *Cymindis vaporariorum* can be found by searching at the roots of heather or by turning over the peat in peat-cuttings.

Moles' nests contain species of Coleoptera most unlikely to be met with anywhere else. The nest heap can be distinguished from the ordinary upthrows by its much larger size. Dig down into the middle of it with a trowel until the hollow is found containing the nest; this is usually only a few inches below the surface of the ground. The nest is about the size of a man's head; it should be removed intact with both hands and spread on a sheet; the coarser parts can be rejected, the larger species of beetles such as *Quedius othiniensis* being tubed, and the rest examined at home for little species like *Ptenidium laevigatum*. If beetle larvae are found they can be bred by putting the contents of the nest in a tin, merely keeping them moist: in this way I have had *Quedius nigrocoeruleus*. Many fleas of several species will doubtless be found, but in my experience they do not trouble man.

In the autumn, fungi yield a rich harvest. The fresh specimens, of course, contain little, but older ones should be pulled to bits over a sheet. The smaller Staphylinidae are best put into a tube alive; the lower end is dipped into boiling water until all the beetles are dead – about three seconds; they are then wrapped in a little tissue paper which is put into a laurel tube; when the beetles are relaxed (in about three days) they can be set as usual. In this way good specimens a e obtained without matted pubescence. The fungi that have been examined should be put in a heap at the foot of a tree, and further examined at intervals of two or three days.

Most coleopterists cease using their sweep-nets too early in the season. Good catches can still be made in October. In this way I have taken *Apion pallipes* in numbers on Dog's Mercury and Garlic, together with good specimens of several species of *Colon*, and night-sweeping in the woods has yielded species of *Liodes*.

Carrion-traps can be kept going all through the winter and during warm periods hundreds of specimens of *Catops* and *Choleva* will be found. Frost, however, checks fruitful work.

Corn-mills and bakeries will yield supplies of beetles peculiar to those localities. Five minutes sifting of infested corn has yielded hundreds of *Calandra* spp. and a few *Latheticus oryzae*. In the flour stores of bakeries, folded bags should be searched between the folds and just within the bag, and crevices should be examined, especially where the flour meets the wall.

Finally flood-refuse as during the summer will yield thousands of specimens in suitable localities. A bag full of the material can be taken home and examined at leisure. I work through a few hands full at a time to find what is present, and leave the bag out in the open. In this way it is kept sufficiently moist to maintain the life of the beetles, and it can be further examined as opportunity occurs.

Hoverflies in our garden

by Jacqueline Ruffle (5911)

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It was my father who first introduced me to hoverflies, teaching me which yellow and black buzzing insects I needed to treat with respect, and which were totally harmless. Although it was years before I came across the concepts of aposematism or Batesian mimicry, I gained much juvenile joy from watching friends run screaming from innocent flies, despite my assurances that they posed no threat.

Since those days, hoverflies have remained objects of fascination to me so, when an opportunity arose for me to attend a hoverfly identification course run by Stuart Ball, I jumped at it. Since then, I have been (intermittently) recording the hoverflies seen in our garden. Intermittently, because the demands of family and work – as well as the ratio of sunny to cloudy weekends – mean that the hours I can devote to catching and identifying these insects are necessarily very few and far between. The list that follows (compiled from records for the past five years), is undoubtedly only a small fraction of the total number of species I would find from a structured survey.

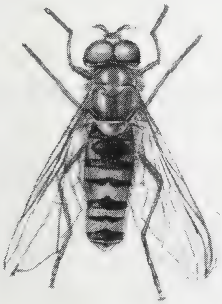
	April	May	June	July	Aug	Sept	Note
Eristalis horticola	×	×	×	×			
Helophilus pendulus		×	×	×			1
Platycheirus scutatus		×					
Dasyrphus venustus		×					
Melangyna labiatarum			×				
Metasyrphus corollae				×			
Syritta pipiens			×				
Chrysotoxum cautum			×				2
Eristalis pertinax				×			
Episyrphus balteatus			×	×	×		3
Syrphus ribesii				×	×	×	
Didea fasciata						×	4

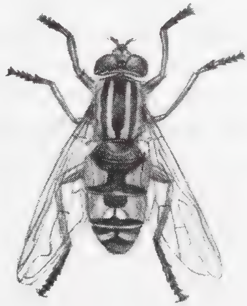
1. *H. pendulus* is regularly seen sitting on the leaves of the plants in our pond, or patrolling its territory. Curious by nature, it will often settle on an outstretched hand.

2. *C. cautum* may have a commensal relationship with ants as they share underground passages. The hoverfly larvae may feed on the root aphids, which are often attended by ants. However, no direct evidence of such interspecific interactions has been proven. (Stubbs, 1983)

3. *E. balteatus* is a variable species; causing me many head-aches when I first started trying to identify them!

4. *D. fasciata* is an interesting find; described as "Nationally scarce", with a "Surrey status" of "Local" at woodland / scrub edges (Morris, 1998).





The common Hoverflies, *Episyrphus balteatus* (left) and *Helophilus pendulus* (right).

At the end of our garden there is a small patch of common land supporting a few Oak trees, as well as the ubiquitous brambles and rose-bay willowherb. A few years ago, it was over-run with bracken, but the Council, in their wisdom, decided to clear it. Unfortunately, there used to be occasional sightings of badgers snuffling through the bracken. Since the bracken has disappeared, so have the badgers.

The garden is north facing and made up largely of bushes with a bit of grass and a small pond. The areas of the garden most attractive to hoverflies are the pond, and the *Pyracantha* and Ivy (*Hedera)* plants.

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A difficult read on the bus – obscure and curious items of entomological literature, part 4

by Richard A. Jones

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Over several years, Brian Gardiner, a previous editor of this journal, published a series of articles on some lesser-known entomological books in his library. He did this in a spirit of clearing up some bibliographical inconsistencies, giving interesting background to several important and historical works. In a similar vein I offer some details of a few obscure and curious books that have found their way into my own library. However, in a departure from Brian Gardiner's theme, the books I offer are not useful key works by important entomologists, they are strange oddities, quaint and off-beat. But they are all peculiarly entertaining and I treasure them all.

The letters of Rusticus on natural history, edited by Edward Newman, London, John Van Voorst, 1848

Although the title page and foreword of this slim 172-page octavo volume claim merely editorship for Newman, it was later revealed that he was actually "Rusticus", the author of these charming natural history essays. He wrote them whilst living in Godalming, Surrey and he frequently makes mention of places in and around the town. At the end of the book is a short flora of the area by J.D Salmon, and a list of birds by Newman himself.

The tone of Newman's writing is typical "country squire", and much time is spent trying to sneak up on and dig out weasels "the weasel has an excellent nose", or shooting birds with his "double-barrelled patent percussion...copper caps, powder and shot, and the etceteras of bird-stuffing." The essays are on birds, animals, local walks, and an exotic-sounding trip to the Isle of Wight, but more than half the book is given over to insects.

A large part of the entomological essays are on various insect pests – the gooseberry sawfly "one of the greatest nuisances that ever afflicted a fruit-garden", the gooseberry aphis "a quiet, dull, stupid looking animal", hop-fly (another aphid), apple weevil, little ermine moth and so on. They make fascinating reading, especially as Newman includes a wealth of practical, historical and financial information gleaned from local farmers and national markets (the hop industry for instance) during the first decades of the 19th century.

When I bought the book I took the opportunity to read it on the bus whilst commuting to work in London. It made a change from all the blockbuster novels being read by others aboard. I had devoured his observations on tiger beetles, gooseberry pests, the green oak moth and turnip-fly, when I suddenly noticed the newly-revealed running head at the top of page 99; it pronounced in clear capital letters the single word "nigger".

I cringed, hoping that none of the other passengers would see it and think that I was reading some sort of racist literature. I adjusted my hold on the book and covered the offending word with my thumb. Unfortunately, the same running head appeared for the next five pages and I had to keep up my ungainly grip for several more stops to The Oval. The subject of Newman's repugnantly-named essay was the black caterpillar of the turnip sawfly, *Tenthredo centifoliae* (now *Athalia rosae*). He writes deridingly of what he regards as an objectionable pest, but nowhere in his text is anv outright racist comment. Despite my discomfort, I had to acknowledge that, unacceptable as the word may be today, in Newman's time such language was the norm and not worthy of a second thought. I hurried on my reading and soon returned to Newman's cosy world of Godalming.

The book is sprinkled with delicate wood engravings, including a nightingale trap, the aforementioned sawfly larvae, a company of puffins and Godalming Church. The very last page shows a charming vignette of an armed fowler stalking two ducks on a lake. I have, at times, adapted this picture for my own purposes, altering the rifle barrel into an insect net.

Figure 1. With a few pen strokes, the gun-toting fowler becomes a stalking entomologist.

My interest in Edward Newman was originally stimulated when I discovered that he was buried in Nunhead Cemetery, in south-east London, only a few hundred yards from my house. I have even visited

his grave there, marked with a leaning ivy-covered headstone. When he left Godalming, he took a house in the up-and-coming Surrey village of Peckham, six miles south-east from Charing Cross on the new railways and very convenient for trips to the capital for meetings of the Entomological Society and other London entomologists.

I have several of Newman's better known works, including his huge *An illustrated natural history of British butterflies and moths* (1869) and *A familiar introduction to the study of insects* (1841), but his pseudonymous account of rambles round Godalming remains my favourite by far.

Beetles, Bush-crickets and other Insects in Lycia, Turkey

by Stuart Cole (10159)

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In early June 2002 I made an all too brief visit to south-west Turkey for my second look at its very rich insect fauna. The country is a centre of diversity for some genera of insects and plants and there are also some interesting relict species from pre-glacial times. Among insects perhaps the most remarkable of these is the euchirrine scarabaeid *Propomacrus bimucronatus*. This is a fairly big black beetle in which the male has the enlarged fore legs that are a characteristic of the sub-family. All the other 12 members of the Euchirrinae are very large insects confined to east and south east Asia and the only other species of the genus *Propomacrus* is found in China. I have never come upon *P. bimucronatus* before and I believe that it is very rare. Many widespread Mediterranean and European species are more common in Turkey than elsewhere, including some that have become scarce in western Mediterranean countries. A notable example is the magnificent Pine Chafer (*Polyphylla fullo*) which is now rare over much of its range but is still a common insect in south-west Turkey. *P. fullo* is the largest chafer in the region, the females growing to 3.8cm in length. The slightly smaller males have outsize fan-shaped antennae; both sexes are dark brown densely flecked with patches of cream-white scales.

An outstanding entomological feature of this region of Turkey are the great gatherings of Jersey Tiger Moths (*Euplagia quadripunctata*) in certain small wooded valleys where they spend the summer sheltering

from the heat and drought. I know of one on the coast near Fethiye and another on the island of Rhodes nine miles from the mainland.

There is also one such valley on the Aegean island of Paros between Turkey and Greece. Of these, I have visited only the valley on Rhodes. "The Valley of the Butterflies", as it is called, is cooled by a clear stream and the shade of trees of *Liquidambar orientalis* (another pre-glacial relict). In June each year, the moths settle here in many thousands on rocks and the foliage of trees. Unfortunately, the valley is a tourist attraction. Increasing disturbance by visitors, who (despite the notices telling them not to) can't resist shaking the tree branches to see the multitude of moths fly out, is apparently causing a significant decline in the numbers of moths.

Being restricted to just one week in Turkey, I booked myself a package holiday to Hisaronu, a village in the hills above the well-known resort of Olu Deniz. This turned out to be a happy choice of location since Hisaronu is surrounded by forested hills and small farms and situated at the foot of Babadag (Mt Baba). The forests are dominated by Red Pine (*Pinus brutia*) with some small tree species beneath, mainly the oak *Quercus infectoria*, Eastern Strawberry Tree (*Arbutus andrachne*), *Styrax officinalis* and the very ornamental, pink flowered, Judas Tree (*Cercis siliquestrum*). On Babadag, pine is replaced by Cedar of Lebanon (*Cedrus libani*) at around 3,500 feet altitude.

The fields around Hisaronu are edged by tall bushes of Spanish Broom (*Spartium junceum*) and their flowers attracted hordes of the little black chafer *Oxythyrea funesta*, which was abundant everywhere in the area, and also many of the handsome red and black longhorn *Purpuricenus desfontenei* along with a few other beetles including the longhorn *Vadonia unipunctata*, orange with a single black spot on each elytron, *Coryna scabiosae* (Meloidae) and a species of *Rhagonycha*, which was *R. fulva* as far as I could determine. Small black alleculid beetles of the genus *Podonta*, including *P. soror*, were common on the flowers of herbs.

Other insects on *Spartium* flowers included the earwig *Forficula smyrnensis*, which has four yellow spots on the wings, and a distinctive grey pentatomid bug that I have not been able to identify. This latter insect was 1.5cm long, the grey flecked with tiny black spots and dull white scales. The abdominal segments had serrated flanges and the head and pronotum were edged with spines.

I had expected that, with the amount of fresh cow pats and mule droppings scattered through the scrub, there would be a host of interesting dung beetles but I was disappointed to find a few of just one species. This was *Onthophagus ganglbaueri*, a dull black beetle,

quite large for this genus. It seems that even in such small scale family farms, worming drugs have virtually eliminated coprophagous insects. Even the plentiful wild tortoises in the vegetation around the village avoided eating the dung though I found them happily gorging on human and dog excreta.

Few insects came to the hotel and street lights but among them there were a number of fine beetles: the chafers *Polyphylla fullo*, *Anoxia orientalis* and *Anoxia villosa* and the longhorn *Prionus besicanus*. The latter is an East Mediterranean species very similar to *P. coriarius* which also occurs in Turkey.

In the conifer forest on the slopes of Babadag, insects were not numerous, although stout 1.5cm long tenebrionid beetles of the genus *Dailognatha* were as frequent on tracks inside the forest as they were on the outside. These had a faint blue tinge to the shiny black integument. There are a number of very similar species in the eastern Mediterranean and I was unable to determine exactly which these were but I think they were either *D. quadricollis* or *caraboides*. A couple of *Dailognatha* were found with another tenebrionid, *Cephalostenus orbicollis*, feeding on the discarded chaff of grass seeds outside a nest of harvesting ants (*Messor* sp.).

Insects were much more varied and abundant in the scrub and farmland around Kaya Koyu about three miles away at a slightly lower elevation than Hisaronu. The "ghost town" of Kaya Koyu was once inhabited by Greeks but is now mostly a large cluster of ruined houses and churches on a hillside overlooking a valley of farmland. The buildings have been empty since 1923 when the entire population were ordered to move to Greece under an international agreement.

A variety of mature trees of a size not seen in the wild, mainly *Celtis australis*, *Quercus infectoria* and a species of *Pistacea*, grow around Kaya and along the surrounding fields many of which are separated by narrow walled lanes. Down one of these lanes I came upon a clump of the dramatic Dragon Arum *Dracunculus vulgaris*. This plant consisted of four one-metre high stems each topped by a large foul smelling inflorescence enclosed within an 18-inch purple spathe and was surrounded by a mass of rather withered palmate leaves. The long lurid purple spadix that protruded from each spathe produced a smell resembling putrid carrion. This smell was detectable to me only from within a few inches but presumeably to the insects that pollinate this plant the scent can be detected from a much greater distance and, present at the time, were a few beetles of the genus *Necrobia* and some flies.

Numerous and conspicuous Neuroptera, Hymenoptera and Diptera flew over the lower vegetation around Kaya, some stopping to feed on flowers of purple thistles and other composites or those of low bushes of *Origanum*. The Neuroptera were represented by giant antlions of the genus *Palpares* and the elegant streamer-tailed lacewing *Nemoptera sinuata,* more abundant here than I have seen it anywhere. In *Nemoptera* the hindwings are very narrow and extremely elongate, reaching a length of 4.5cm in this species, while the black and white forewings are large and rounded to compensate. There were also more bee-flies (Bombyliidae) of different kinds than I have found elsewhere and large brown robber flies (Asilidae) chased after their favorite prey, the big horse flies of the genus *Tabanus*; one was also seen carrying the longhorn beetle *Purpuricenus*.

Among the hymenoptera were several kinds of social wasp. There were at least two species of *Polistes* and two of *Vespula* and/or *Dolichovespula*, while *Vespa* itself was represented by the big hornet *V. orientalis. Vespa orientalis* is very common in south west Turkey and seems to replace the common European hornet *V. crabro* in parts of the eastern Mediterranean (at least I have never found the two species together in the same locality). Although both species occur in Turkey and eastwards across Eurasia to China, the range of *V. crabro* is generally to the north of that of *V. orientalis. Vespa orientalis* is larger than *V. crabro*, the workers being 3cm long, and more boldly coloured with the chocolate-brown abdomen crossed by a broad band of bright yellow. The hornets swept across the roads and tracks in search of prey and were always attracted to any trickle of water in this parched country. When a hornet caught a beetle or fly it would carry the insect to a nearby shrub and hang upside down on a twig by its hind legs while devouring its meal.

Much bigger still than the hornet, were the females of *Scolia flavifrons* that feasted at thistle heads. The 4cm long body of this wasp is partially covered with coarse hair, mainly black, turning to red on the terminal segments and there are four bright yellow spots on the abdomen; the bare head is orange-red and armed with large sickle-shaped mandibles. Two kinds of bumble bee were also numerous on the flowers of thistles; the more numerous of these looked very like *Bombus terrestris*.

Orthopterous insects abounded on the ground and low vegetation, especially various wingless kinds of bush cricket. Grasshoppers and little mantids were also numerous. Mature mantids of a species of Empusa were common on shrubs and tall herbs. This was probably *E. fasciata*, which, like the west Mediterranean *E. pennata*, has a high cone-like crest on the head. The most distinctive bush cricket species

were of the genera *Eupholidoptera* (Decticinae), *Poecilimon* (Phaneropterinae) and *Saga* (Saginae). These genera have their centre of distribution in the eastern Mediterranean and Middle East, and are particularly diverse in Turkey. One common kind of *Eupholidoptera* (either *E. anatolica* or *E. tahtalica*) was handsomely marked with grey and black. The most abundant bush cricket was a brightly coloured species of *Poecilimon*, a large genus of 127 species. I think this species, with longitudinal brown, white and black bands on the abdomen, was *P. pulcher*.

Finest of all was one, or possibly more, of the giant species of the genus *Saga* that were common on shrubs. All those found were pale green immatures except for a single adult female *Saga natoliae* that was in a Carob tree. The body of this specimen was 10.2cm in length including the long ovipositer; in colour it was mostly shades of green with the head red brown, chestnut brown margins to the abdominal segments and ovipositor yellow-brown. The species occurs from the Balkans through Turkey to Syria. The 14 species of *Saga* range from the Mediterranean region to the Middle East and SW Russia, although only one of these, *S. pedo*, reaches the west Mediterranean where it is apparently rare. The biggest of the genus, *S. ephippigera* from eastern Turkey, is comparable in size to the giant Orthoptera of the tropics. One museum specimen that I have examined, an adult female, had a body length of 12cm, the abdomen 2.5cm broad and total length with legs reaching 19cm. *Saga* species are said to feed exclusively, or almost so, on other bush crickets.

Amongst beetles, there were *Podonta* spp. and the little metallic green *Trichodes laminatus* on *Origanum* flowers and the tenebrionids *Opatroides punctulatus* and *Dailognatha* spp. on dusty paths. In the late afternoon, at between 5.00 and 5.30pm, with the heat of the sun now pleasantly subdued, buprestid beetles started buzzing across from bush to bush. There were two kinds: *Julodis onopordi* and *Capnodis cariosa* and possibly a third. *J. onopordi*, is common in SW Turkey; fresh specimens are clothed in yellow hair. *Capnodis cariosa* is a fine insect reaching a length of 4.5cms, the integument is very hard and black decorated with patches of pure white scales. I had noticed that the bigger kinds of Buprestidae in the pine forests (eg *Chalcophora detrita*) also took to flight at this same time of day.

I spent a couple of days in the highland country to the north of Fethiye. Access was through a pass between the ranges of the Ak Daglari and the Boncuk Daglari, the slopes above the pass supporting impressive forests of *Pinus brutia*. Beneath the trees the attractive Smokebush *Cotinus coggyria* was in flower and these swarmed with little beetles. *Mycterus curculioides* and *Chrysanthia viridis* were the

most numerous and other species included the black, white and red clerid *Opilo taeniatus.* The large click beetle *Paracalais pareisi* was found here in a rotton pine stump. This species is 3cm long, black and grey with two eye spots on the pronotum.

Beyond the pass the country becomes more level as the valley between the mountain ranges widens to two or three miles or so. The floor of the valley is quite fertile being crossed by streams and is cultivated with cereal crops. The streams are lined with willows, poplars and the occasional plane tree while the road and field sides were colourful with the massed flowers of varied herbaceous Compositae, Leguminosae, Boraginaceae and others. I stopped at many spots along the streams between the villages of Kinik and Sogut but, despite the many old trees, little in the way of Coleoptera was found. *Cantharis annularis* and a species of Harpalus were common on grass heads and another carabid was *Diachromus germanus,* with orange and black elytra and metallic green pronotum, on damp ground on the flood plain of the stream. A dog carcass here produced many of the staphylinid *Creophilus maxilosus,* the dark metallic blue histerid *Saprinus semistriatus* and the silphid *Thanatophilus terminalis.*

Continuing on past the town of Korkutelli on the second day, I finally arrived at Mount Gulluk. This exceptional locality is the site of the ruined Pisidian city of Termessos and is also a national park protecting a rare fragment of Mediterranean mixed broadleaf forest. It is very rich in insects and the park guards are aware of the temptation to collect here. Upon arriving at the car park I was immediately questioned on the contents of my backpack; fortunately I had no incriminating equipment with me. The reserve also holds a fair variety of other wildlife. There has even been evidence in recent years of the very rare Anatolian race of the leopard passing through. One curious little reptile that I came upon was a shiny pink worm-like creature curled up beneath a rock. It appeared to have no eyes and I assumed that it must have been a Blind Snake *Typhlops vermicularis.*

There are several zones of vegetation up the mountain. From the base at around 600 feet altitude to around 1,000 feet there is conifer forest of *Pinus brutia* with small trees of *Arbutus andrachne* and an understory of the shrubs *Pistacea lentiscus, Spartium junceum, Quercus coccifera* and species of *Phyllyria* and *Cistus.* Then from 1,000 to 2,000 feet the slopes are covered with a dense scrub of *Quercus coccifera* with *Phiomis fruticosa* and *Spartium junceum.* The broadleaf forest from 2,000 to 3,300 feet is dominated by the oak *Quercus infectoria.* Other trees here are *Ostrya carpinifolia, Acer monspessulanum, Styrax officinalis, Laurus nobilis,* and unidentified species of *Pistacea, Crateagus,*

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Illustration: Phil Wilkins

The *Bulletin* cover picture shows a watercolour of our missing Lucanid, the extinct Blue Stag Beetle *Platycerus caraboides*, by Phil Wilkins. This species was last recorded in Britain before 1830. It was formerly recorded from certain well-wooded districts such as Oxford and Windsor, although information regarding the historical status and distribution of this species in Britain is hard to come by. The Blue Stag Beetle is generally associated with deciduous lowland woodland habitats, particularly Beech, and can still be found across much of Europe, but like many saproxylic species, it is increasingly threatened in many countries through continuing loss of habitat.

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Editorial

This issue of the *Bulletin* has been a pleasure to prepare. After burning the candle at both ends for so long, and spending long dark winter evenings at Cravitz Printing working on a new format for the colour section (many thanks gentlemen), it would appear that the fruits of our labour are not unfavourable!

This edition brings together a theme on the Stag Beetle family (Lucanidae) which will be continued into the next *Bulletin*. This sequence of articles has allowed a range of pertinent issues to be addressed, from the recent development of knowledge regarding the lifecycle of the Stag Beetle, to questions raised regarding the true status of this species in Britain and Europe. Deborah Harvey and Alan Gange have produced an excellent illustrated article describing the life history of the Stag Beetle *Lucanus cervus*, and a second illustrated article describing all of the British members of the Stag Beetle family has been produced to place this into perspective. This in turn lays the foundation for an article which will appear in the February *Bulletin*. This article collates distribution data and attempts to assess the true status of the Stag Beetle in Europe.

Available evidence suggests that the Stag Beetle is a *bona fide* member of the remarkable Thames Terrace Invertebrate fauna, a fauna which occurs in habitats present on the free-draining soils of the Thames Basin by virtue of the 'continental' nature of climate in that region. This links in well with the explanation for the diverse species-rich aculeate hymenopteran fauna of this region, as highlighted by the illustrated article on the aculeate fauna present in Bushy Park.

Richard Jones has provided some extraordinary pictures of the very rarely recorded bizarre wingless female of the beetle *Drilus flavescens*, which we believe are the first photographs to be published. André Teunissen has also provided a superb picture of two male Stag Beetles duelling in a shaded European forest. In the light of these high quality contributions, it is surely time to complement the Hammond Award for best article with a similar award for pictorial contributions (although I will not be stepping down from council to have a bash at these myself!)

Season's greetings and best wishes for a happy, prosperous and entomologically rewarding New Year.

Peter Sutton

Quaint distraction for 30 minutes – obscure and curious items of entomological literature, part 5

by Richard A. Jones

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Over several years, Brian Gardiner, a previous editor of this journal, published a series of articles on some lesser-known entomological books in his library. He did this in a spirit of clearing up some bibliographical inconsistencies, giving interesting background to several important and historical works. In a similar vein I offer some details of a few obscure and curious books that have found their way into my own library. However, in a departure from Brian Gardiner's theme, the books I offer are not useful key works by important entomologists, they are strange oddities, quaint and off-beat. But they are all peculiarly entertaining and I treasure them all.

Half hours in the tiny world – wonders of insect life, London, Nisbet & Co., 1903

The "Half hour library of travel, nature and science for young readers" was a popular and prolific series, begun in the 1880s; it continued and was revised into the early years of the 20th century. This was an era of improved efficiency in the publishing industry. Cheaper paper and bigger and faster printing machines meant it was more economic to produce books, whilst a burgeoning middle class had created a populace with improving literacy and increasing prosperity with an insatiable thirst for literature, and for educational and philosophical material.

By the time my copy of this book was printed, in 1903, the series included half hours in: the far north, far east, far south (but wide west!), woods and wilds, the deep, field and forest, with a naturalist... and so on...and so on. They are part of that vast Victorian out-pouring of books for the instruction of children referred to by booksellers as "juveniles", and they still make wonderful reading.

How could I possibly refuse the £2 price of a book with a frontispiece entitled "the ant and his cows", showing a formicine ant using its antennae to tickle a small colony of aphids for their honeydew? And the very first sentence in the book reads: "I'd be a butterfly, happy and gay! But who, if he could help it, would be a caterpillar?" There is no let-up in this bright but archaic chatter, written, seemingly, as a conversation between parent or governess and child.

The facts are more or less correct throughout, as instruction is given on wasps and paper-making, honeybees, silkworms, ants and various noxious flies. The accompanying wood engravings vary in quality, probably have been gleaned from other publications in the publisher's catalogue. Some, such as those of individual insects are clean and clear and crisp – those of the ant-lion, puss moth caterpillar and horse-fly could be from any modern book. Others are rather muddy, probably wearing down after too many imprints had been made from them. My favourites, though, are the little vignettes that start each chapter. They show petticoated children rowing in a boat, or sitting and reading in the garden, distant horizons of rather fanciful palm trees, camels trooping across the desert and a gardener pointing out some invisible object on a bush. I can almost hear him: "Here, Sonny, see that, that's a caterpillar that is, munching my azaleas, but one day it'll be a butterfly, happy and gay".

Figure 1: The gardener, the boy, and the caterpillar!

The Aculeate Hymenopteran Fauna of Bushy Park, Middlesex

by Dr Peter G. Sutton (7388)

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Introduction

Bushy Park (Grid reference: TQ 155 698) is situated in a loop of the River Thames to the south of Teddington in Middlesex. It occupies an area of 450 hectares (1,099 acres) on a virtually flat site that has been occupied by settlers for at least 4000 years. Prior to its enclosure by subsequent owners, its rich alluvial soils were cultivated, and evidence of the largest and most complete mediaeval field system in Middlesex can be found to the south of the Waterhouse Woodland Gardens* (Haynes, 1993). From the mid-sixteenth century onwards, Bushy Park has been maintained more or less continuously as a Royal Deer Park.

Bushy Park, and Hampton Court Park, with which it is inextricably linked, forms the second largest of eight Royal Parks to be found in the London region, and together with Richmond Park and Greenwich Park, they constitute the three "outer" Royal Parks of London.

Bushy Park is a remarkable place from a number of different perspectives. As a royal playground for the kings and queens of England, it has been associated with royalty since Hampton Court Palace was first acquired by Henry VIII as a "gift" from Cardinal Wolsey in 1529. As a Royal Deer Park, it provides a classic example of a habitat that has been shaped and maintained through a long-standing association with large grazing mammals. Bushy Park also demonstrates how a large number of "alien" species, from Red-eared Terrapins *Trachemys scripta*, Mandarin Ducks *Aix galericulata*, and Ring-necked Parakeets *Psittacula krameri*, to the Bryony Ladybird *Epilachna argus*, Grey Squirrel *Sciurus carolinensis*, and a North American leaf-hopper *Graphocephala fennahi*, can co-exist with, and in some cases, even come to characterise the fauna of the Park. Finally, it has recently been colonised by such postulated indicators of global climate change as Roesel's Bush-cricket *Metrioptera roeselii*, Long-winged Cone-head *Conocephalus discolor*, and the **Bee Wolf *Philanthus triangulum***, thus exemplifying the dynamic nature of species distribution with respect to climate.

* Richard Church (1993) offers the following description of the Waterhouse Plantation "Here and in the Isabella Plantation in Richmond Park, are two of the most beautiful man-made scenes that I have found anywhere in Europe."

The forgotten Royal Park?

Bushy Park has remained largely unrecognised as an important haven for wildlife, and while its neighbours across the Thames, Richmond Park (which has now become a National Nature Reserve) and Wimbledon Common, have been designated as Sites of Special Scientific Interest (MAFF, 2000), and are candidate Special Areas of Conservation (SAC) to be designated under European legislation for their invertebrate and habitat interest, Bushy Park has received little attention. In another example, a review of the Capital's acid grassland resource (London BAP, 2001) cites Richmond Park, Wimbledon Common, Hounslow Heath and Leyton Flats as sites of nature conservation value, whereas Bushy Park remains unmentioned, in spite of its considerable acid grassland resource.

There is much literature, for obvious reasons, describing Bushy Park and Hampton Court from a historical perspective, but very little information describing the remarkable natural history of this Royal Deer Park**.

In *London's Natural History* (Fitter, 1953), Bushy Park is mentioned only for its famous avenue of Horse Chestnut trees planted by Sir Christopher Wren, and *Wildlife in the Royal Parks* (Simms, 1974) provides but the briefest details of non-avian fauna to be found in the Park. This latter work does however allude to the first hymenopteran survey of Bushy Park undertaken by Yeo (1957). It was this first survey that provided the stimulus for subsequent surveys of the aculeate fauna of Bushy Park, and these surveys have collectively documented the aculeate fauna of Bushy Park for over half a century. Consequently, Bushy Park is one of the best recorded sites for the aculeate Hymenoptera in the London region, and these surveys have provided a valuable record of how that fauna has changed in response to a variety of factors over the last 50 years.

Why is Bushy Park such an important site for Aculeate Hymenoptera?

In order to answer this question, a number of local and regional factors must be considered. From a local perspective, an analysis of habitats present within the Park is required. Bushy Park contains a diverse collection of habitats, from freshwater lakes and sparsely vegetated gravel banks, to dry stone walls, but two habitat resources; lowland dry acid grassland and lowland woodland pasture/parkland, are of

** An illustrated publication describing '*The History and Natural History of Bushy Park*', is currently being prepared (Sutton, *in prep*).

particular importance. Both are UK BAP Priority Habitats (JNCC, 2001), and these habitats in Bushy Park represent resources of regional importance. In the case of lowland dry acid grassland, and arguably in the case of lowland woodland pasture parkland, Bushy Park also represents a nationally important resource.

Lowland Woodland Pasture/Parkland (JNCC, 2001a)

According to the London Biodiversity Audit (2001), Bushy Park contains 240 hectares of open landscape with an ancient old tree resource. In view of the immense value of this veteran tree resource for saproxylic invertebrates and their dependents, the Audit correctly considers this resource separately from the general London woodland resource. Both the veteran tree and general woodland resource in Bushy Park provide a valuable habitat for many species of Hymenoptera. (A very useful list of the Hymenoptera associated with living and decaying timber has been compiled by Alexander (2002) in the form of a provisional annotated checklist, which includes the known habitat requirements and conservation status of each species.)

This resource is particularly important for many solitary species of the aculeate fauna, which require the presence of a variety of dead wood habitats to build their nests.

To take the London Biodiversity Audit figures literally and state that Bushy Park accounts for over 12% of London's veteran tree resource would be misleading. Some areas that have been included in the Audit have very few ancient old trees per hectare. Nevertheless, Bushy Park indisputably contains a significant and increasingly important veteran tree resource, which is reflected in its saproxylic fauna, *e.g.* the spider hunting wasp *Dipogon bifasciatus* (RDB3), the jewel wasps ***Chrysogona gracillima*** (RDB2) and ***Pseudomalus violaceus*** (Nationally Scarce, b), and the **Brown Tree Ant *Lasius brunneus*** (Nationally Scarce, a). The value of this resource is further highlighted by the fact that it provides habitat for what is generally regarded to be the most threatened invertebrate fauna in Europe (Speight, 1989).

Lowland Dry Acid Grassland

Lowland dry acid grassland occurs on free-draining acidic soils, which, in the London region, are generally associated with the sand and gravel deposits of the River Thames basin (the "Thames Terrace Gravels"). It is a nutrient-poor habitat that is usually dominated by fine grasses such as Sheep's Fescue *Festuca tenuifolia*, Common and Brown Bent Grass

Agrostis capillaris and *Agrostis vinealis*, and Wavy-hair Grass *Deschampsia flexuosa*. Other plants such as Harebell *Campanula rotundifolia*, Tormentil *Potentilla erecta* and Sheep's Sorrel *Rumex acetosella*, are also associated with this habitat.

This habitat has become an increasingly rare resource in recent times, and the Habitat Statement for Acid Grasslands (JNCC, 2001b) states that lowland acid grassland is "unlikely to exceed 30,000 ha" in Britain. The London Biodiversity Audit (*loc. cit.*) shows that the London region accounts for approximately 4% of the national resource, but more significantly, it also shows that the combined acid grassland resource of Richmond Park and Bushy Park accounts for almost 2% of the national lowland acid grassland resource. To place both the rarity and the significance of this habitat into perspective, a recent article by Booker *et al.* (2003), showed that Purbeck, a nationally important area of outstanding biodiversity stretching across 40,000 ha of rural Dorset, accounts for 2.5% of the national calcareous grassland resource.

The acid grassland habitat in Bushy Park, Richmond Park, and similarly managed sites has survived as a result of the fortuitous and long-term fulfillment of its main conservation requirement, low intensity grazing. Indeed, Collenette, in *A History of Richmond Park* (1937), notes that: "It is principally due to the deer that the park is open ground and not covered with bushes, as are the adjacent commons". More recently, mowing has become the preferred method of habitat management on sites that were formerly grazed.

It would appear that recognition of the conservation value of lowland acid grassland as a habitat resource, particularly for invertebrates, is a fairly recent phenomenon. Accordingly, coherent details of the invertebrate assemblage for this habitat are almost non-existent, and are not discussed in texts such as *Habitat conservation for insects – a neglected green issue* (Fry and Lonsdale, 1991) and *Habitat management for invertebrates: A practical handbook*, (Kirby, 2001), both of which are recognised as standard works by those involved in invertebrate conservation. However, Kirby, and subsequently, the Habitat Action Plan (JNCC, 2001b), do state that "Many of the invertebrates that occur in acid grassland are specialist species which do not occur in other types of grassland"***. Importantly, Kirby also points out that where acid grasslands are present on loose sandy soils, they can "support a considerable number of ground-dwelling and burrowing invertebrates".

*** A forthcoming paper entitled: "*Acid Grassland, an important BAP Priority Habitat for Aculeate Hymenoptera*" (Baldock and Sutton, *in prep*) will discuss the importance of lowland dry acid grassland habitats for aculeates, and attempt to identify those species which may be considered to be acid grassland "specialists".

The importance of bare ground habitats for a significant number of invertebrates, including many Nationally Scarce and Red Data Book species, is now widely recognised (Key, 2000; Harvey, 2000; Howe, 2003). It is the presence of extensive bare ground habitats in Bushy Park that accounts for the observed species-richness of aculeates in its dry acid grassland habitat.

The Thames Terrace Invertebrate Fauna

The fact that Bushy Park contains two important BAP Priority habitats and a variety of additional habitats for invertebrates does not provide a satisfactory explanation for either the diversity of species present in the Park, or the on-going success of the Bushy Park aculeate fauna.

For instance, the Park contains species such as the rare mining bee, ***Andrena florea*** (RDB3) (Figure 1), which is normally associated with sandy or heathland habitats in southern England.

Figure 1. UK distribution of *Andrena florea*.

Other species that are otherwise strongly linked with *e.g.* dune systems and other coastal habitats, or dry calcareous grasslands, are also present among the aculeate fauna of Bushy Park. Clearly an additional explanation is required, and is provided by Harvey (*loc. cit.*), in his assessment of the invertebrate fauna of Britain's driest region, the "East Thames Corridor".

Harvey explains the presence of the extensive invertebrate fauna of Thames Terrace grasslands in terms of a "unique combination of climatic, geographical and ecological factors". These factors, which account for the almost continental climate experienced by the east Thames region, have allowed invertebrates that might otherwise be considered to be *e.g.* heathland or dry calcareous grassland specialists in another region, to do equally well on the dry grassland habitats provided by the Thames Terrace Gravels. A measure of the extraordinary biodiversity that can be found at some sites in this region is again provided by Harvey (1998), who reveals that at one site in Thurrock, "the Invertebrate Index (a measure of the biodiversity and rarity of the invertebrate fauna present) within an area of one square kilometre is greater than that of Salisbury Plain, a vastly greater area of acknowledged national importance in Britain..".

Viewing the big picture: the "Ham radius"

The aculeate fauna of Bushy Park can now be rationalised in terms of the habitats that the Park provides, and the complex interplay between the climatic, geographical and ecological factors described by Harvey that led to the establishment of the Thames Terrace invertebrate fauna.

However, there is an additional and important factor that must be taken into account in order to explain the on-going success of the aculeate fauna in Bushy Park.

It is possible that this factor may also account for the success of the aculeate faunas of Richmond Park and Wimbledon Common, and almost certainly those of much smaller sites in this region, such as Barnes Common, that should theoretically be suffering from the effects of habitat fragmentation.

That factor is the close proximity of all of the above-mentioned acid grassland sites within a remarkably small region of west London which we refer to as the "Ham radius".

Figure 2 shows the mosaic of acid grassland sites that exist within a 5-mile radius of Ham in Surrey.

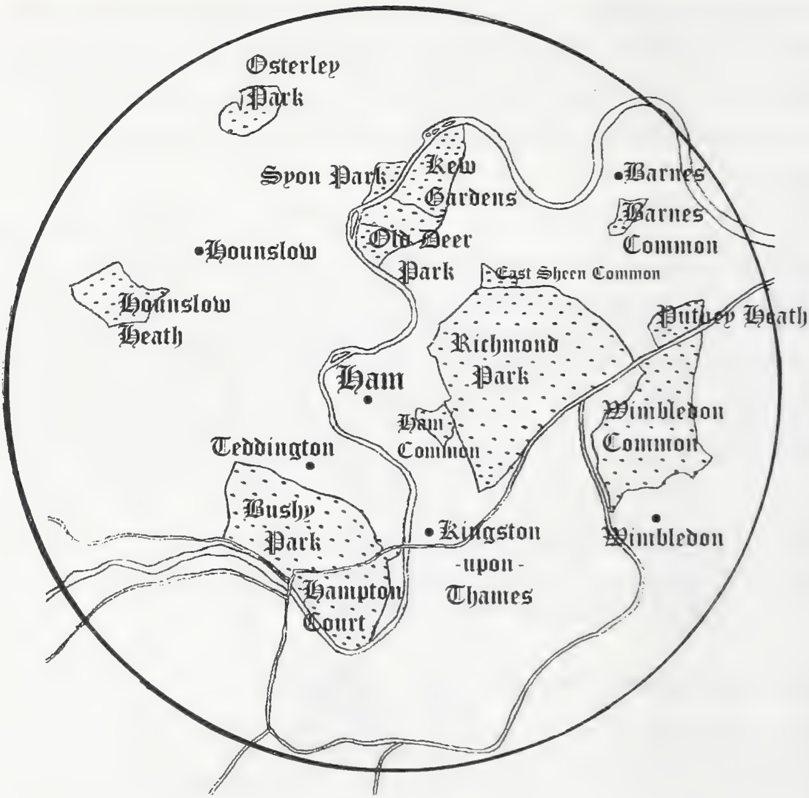

Figure 2. The Ham Radius

The Ham radius sites include: Bushy Park and Hampton Court, Richmond Park, Wimbledon Common and Putney Heath, Hounslow Heath, Barnes Common, Ham Common, East Sheen Common, Kew Gardens, Old Deer Park, Osterly Park, Gunnersbury Park and Syon Park.

Sites that have become isolated begin to lose their biodiversity for a number of reasons, and the effects of habitat fragmentation have been assessed and discussed by a number of authors (Falk, 1991, and references therein). Falk (*loc. cit.*) recognises that habitat fragmentation has serious implications for aculeates, and cites the observed decline in the aculeate fauna of Hampstead Heath as a classic example. The decline of the "once exceptional bee and wasp fauna" of Hampstead Heath has been discussed by Guichard and Yarrow (1948), who

attribute this decline to its gradual "loss of wildness", but as Falk correctly points out, it has been the "progressive isolation from nearby countryside" that has almost certainly played the major role in this decline. Prior to this decline, the wasp fauna of Hampstead Heath was virtually identical to that of Bushy Park, and had there been sufficient data describing the spring aculeate fauna of Bushy Park, this data may also have increased the similarity between the respective bee faunas of each site.

It is likely that the close proximity of the habitats that exist within the Ham radius has allowed the aculeate fauna of these sites to prosper. It is also possible that the rich aculeate fauna of some very small sites within this mosaic, can be explained by the fact that they form part of a larger pattern of stable metapopulations, which facilitates the continuing prosperity of these "satellite" colonies.

Table 1 provides a summary of statistics regarding the two BAP Priority Habitats present within the Ham radius.

Table 1. Ham radius statistics (in accordance with figures quoted in the London Habitat Audit and UK Habitat Action Plans, *loc. cit.*)

BAP Priority Habitat	**% of London resource**	**% of National resource**
Acid grassland resource	58 % (731 ha / 1264 ha)	2.5 % (731 ha / 30,000 ha)
Ancient/ old woodland resource	56 % (1068 ha / 1899 ha)	5 - 10 %† (1068 / 10 – 20,000 ha‡)

† For reasons outlined above, this is almost certainly an overestimate.

‡ Where 10 – 20,000 ha represents the "current best estimate" of this resource provided in the Habitat Statement of the UK Biodiversity Steering Group Report (1995).

The Aculeate Hymenoptera of Bushy Park

The first survey of the aculeate fauna of Bushy Park was published by P. F. Yeo (1957), which described his recording activities between August 1948 and May 1953. Yeo recorded a total of 102 species during this period, although some of these records were taken from his garden in Park Road, Hampton Hill, which is a quarter of a mile from the Park boundary. Using these records, Yeo made a comparison between the respective aculeate faunas of Hampstead Heath and district, and Bushy

Park and district, and noted the remarkable similarity between the current wasp faunas of each site (Table 2):

Table 2. A comparison of Bushy Park and district aculeate fauna with Hampstead Heath and district (1957).

	Bushy Park and district	Hampstead Heath and district (total)	Hampstead Heath and district (present century only)
Wasps	58	79	63
Bees	44	122	101
Total	102	201	164

Yeo points out that several species that have disappeared from Hampstead Heath and district: ***Pompilus crassicornis, Mimesa equestris, Andrena flavipes, Andrena florea, Andrena humilis* and *Anthophora retusa*** still occur in Bushy Park and district.

The second survey was undertaken by J. C. Felton (1967), who collected records from Bushy Park between June 1952 and May 1966. Like Yeo, Felton also included records from his own garden, which was situated 100 yards away from the Bushy Park boundary. Felton (who also provided a list of 16 species of Sawflies (Hymenoptera: Symphyta) found in Bushy Park), included several species of ant (Formicidae) during his observations, and compared the updated list of Bushy Park and district aculeate fauna to the most recent Hampstead Heath and district list (Table 3):

Table 3. A comparison of Bushy Park and District aculeate fauna with Hampstead Heath and District (1967).

	Bushy Park and district	Hampstead Heath and district (total)	Hampstead Heath and district (present century only)
Wasps	63	83	65
Ants	4	16	-
Bees	54	122	101
Total	121	221	173

Felton concluded that: "Thus the known fauna of Bushy Park remains poorer than that of Hampstead Heath, particularly as regards bees".

A further supplement to the known aculeate fauna of Bushy Park was provided by Guichard (1972), who made nine visits to Bushy Park

between 27th June and 4th September in 1971, and added over twenty species to the list. Guichard recorded the presence of a thriving colony of the mellitinine bee, ***Dasypoda altercator*** (=*Dasypoda hirtipes*) (Plate 2), which was the first record for this species in the London district since a single specimen was taken at Hampstead Heath almost a century earlier in 1878. A useful list of "further records of previous infrequent occurrences" was also provided.

Between August and September 1992, Peter Hodge made three visits to Bushy Park to evaluate the invertebrate interest of dead wood habitats in Bushy Park. Conclusions drawn from these visits included the important statement: "The southern part of the Park contains a number of huge Oak trees. These are virtually certain to support a valuable community of rare insects" (Hodge, 1992). This survey provided the first record of the Brown Tree Ant, ***Lasius brunneus*** (Nationally Scarce, a), and another addition to the list: the sphecid wasp ***Crossocerus styrius*** (which, although described by Yeo and Corbet (1983) as "rare and local", does not appear to be listed in Falk (1991).)

During 2003, the authors made five visits to Bushy Park between late July and early September, and recorded 80 species of aculeates, including 36 new species which were previously unrecorded from Bushy Park (Table 4). This brings the total number of aculeates recorded from Bushy Park (including *Crossocerus styrius*) to 147 species, and the total recorded from Bushy Park and district to 175 species. (Taking the total number of UK aculeates to be 520 species (Falk, *loc. cit.*), this latter figures represents over one third of the UK aculeate fauna.)

Observations and discussion

There are three immediate observations that a hymenopterist is likely to make when they visit Bushy Park. The first is the predominance of Yellow Meadow Ant ***Lasius flavus*** hummocks that dominate large areas of the grassland landscape, and the second is the hive of aculeate activity associated with bare ground habitats provided by the well-worn paths and tracks that criss-cross the Park. The third is the fact that the aculeates that use these paths are almost oblivious to the excessive use that these paths are subjected to every day. Indeed, the bare ground habitat that these species require is maintained by this constant use.

Table 4. A summary of species recorded during the four major surveys of aculeate Hymenoptera in Bushy Park.

CHRYSIDIDAE **JEWEL OR RUBY-TAILED WASPS**

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Elampus panzeri	None	Southern Widespread	Locally common on Heathland. A cleptoparasite of *Psen* spp.				✓
Chrysis angustula	None	Southern Widespread	Commonly found.				✓
Chrysis ignita agg.	None	Widespread	Commonly found. Cleptoparasitic on *Ancistrocerus* species.				✓(S) (1999)
Chrysis gracillima	**RDB 2**	Southern Restricted	Infrequently found. Spreading steadily. Should not be RDB 2 now. Probably associated with smaller, dead-wood-nesting sphecids.				✓
Hedychridium coriaceum	**RDB 3**	Southern Restricted	Scarce and local, despite the common status of its host, *Lindenius albilabris*.	✓	✓	✓	✓
Hedychridium roseum	None	Southern Restricted	Occasionally common in sandy habitats. A cleptoparasite of the sphecid wasps *Astata boops*, *Tachysphex pompiliformis* and *Gorytes tumidus*.				✓
Hedychrum niemelai	**RDB 3**	Southern Restricted	Sandy heaths and grasslands where it is local but rarely common. A cleptoparasite of *Cerceris* spp.				✓
Pseudomalus violaceus	**Nationally Scarce b**	Southern Widespread	Infrequently found. Parasitises dead-wood nesting solitary wasps.				✓
Trichrysis cyanea	None	Universal	Commonly seen on dead wood and bare banks in the sun. A cleptoparasite of several species of small bees and wasps.	✓			✓

TIPHIIDAE

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Tiphia femorata	None	Southern Restricted	Locally common. Sandy places. Parasitises larvae of scarabaeid beetles.			✓	
Tiphia minuta	**Nationally Scarce b**	Southern Restricted	Local but can be commonly found, particularly in malaise traps. Preys on larvae of dung beetles.		✓		✓
Myrmosa atra	None	Southern Widespread	Wingless females occasionally found running over bare ground. Males can be very common in malaise trap catches. Parasite of a variety of ground-nesting bees and wasps.	✓		✓	✓

SAPYGIDAE

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Monosapyga clavicornis	**Nationally Scarce b**	Southern	Very local. Brood parasite of *Chelostoma* and *Osmia*.	✓			✓

FORMICIDAE **ANTS**

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Lasius brunneus	**Nationally Scarce a**	Southern Restricted	Locally frequent. Nests in old trees, especially oaks.				✓
Lasius flavus	None	Universal	Commonly found. The large, dome-shaped nests are an indicator of long-established pasture.		✓		✓
Lasius niger	None	Universal	Very commonly found.		✓		✓

Myrmica scabrinodis	None	Universal	Commonly found in a variety of open habitats.		✓		
Myrmica sabuleti	Local	Southern Widespread	Warm dry sites with short vegetation		✓		
Myrmica ruginodis	None	Universal	Commonly found in many habitats.				✓

POMPILIDAE SPIDER-HUNTING WASPS

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Dipogon bifasciatus	**RDB3**	Southern Restricted, with a strong eastern bias	Rarely found. It hunts crab spiders and nests in dead wood.			✓	
Anoplius infuscatus	**local**	Southern Widespread	Locally common on damp heaths and dunes. Preys on wolf spiders (Lycosidae). Ground nesting.	✓			
Anoplius viaticus	**Local**	Southern Widespread	Locally common on heaths and in heathy woodland. Preys on wolf spiders (Lycosidae). Ground nesting.	✓			
Anoplius nigerrimus	**Local**	Universal	Commonly found. A wide variety of habitats. Ground and cavity nesting.	✓			✓
Auplopus carbonarius	**Nationally Scarce b**	Southern Widespread	Rarely found. Old woodland, often found exploring tree-trunks for spiders. Nests in cavities, including brickwork and banks.				✓
Agenioideus cinctellus	None	Southern Restricted	Infrequently found. A species of cracks and crevices, such as upturned root-plates. Cavity nesting.	✓			
Arachnospila trivialis	None	Widespread	Infrequently found. Associated with open sandy habitats. Preys on crab spiders (*Xysticus*) and possibly wolf spiders (Lycosidae). Ground nesting.	✓			
Evagetes crassicornis	None	Universal	Commonly found, especially in sandy places. A cleptoparasite on other pompilids.	✓			
Priocnemis exaltata	None	Universal	Commonly found. Ground nesting.				
Priocnemis schioedtei	**Nationally Scarce b**	Universal	Infrequently found. A species of woodland edges. Ground nesting.	✓			
Priocnemis gracilis	**Nationally Scarce b**	Southern Widespread	Infrequent and uncommon. A species of clay soils. Coastal, especially in the south and east of England. Ground nesting.	✓			
Priocnemis pusilla	None	Southern Widespread	Infrequently found. Associated with lighter soils. It seems to be a more westerly species in the south of England. Ground nesting.	✓		✓	
Priocnemis perturbator	None	Universal	Frequently found. Particularly associated with woodland. A spring species. Ground nesting.		✓		
Priocnemis parvula	None	Universal	Very common in sandy localities, frequent elsewhere. Ground nesting.	✓		✓	✓

VESPIDAE SOCIAL AND MASON WASPS

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Ancistrocerus gazella	None	Southern Widespread	One of the more frequently found Eumenids. Nests in a variety of cavities. Provisions its nest with small caterpillars.				✓
Ancistrocerus nigricornis	None	Southern Widespread	Infrequently found. Aerial nesting. Indication of decline in recent decades.			✓	
Dolichovespula media	**Nationally Scarce a**	Southern Widespread	A recent colonist in Great Britain. Since 1980 this species has spread steadily northwards and westwards from its first recorded localities in East Sussex. No longer meets conservation category requirements. Queens of this species may easily be confused with worker Hornets *Vespa crabro*. Aerial nesting.				✓
Dolichovespula saxonica	**RDB K**	Southern Restricted	Becoming frequent, particularly in heathy locations. A recent colonist in Great Britain, widely spread below a line from Hampshire to Norfolk. It is easily confused with the very common D. sylvestris and is probably greatly under-recorded. Aerial nesting.				✓
Symmorphus bifasciatus	None	Southern Widespread	Locally frequent in damp places. Nests in aerial cavities and dead wood. Provisions nest with caterpillars.			✓	✓
Microdynerus exilis	**Nationally Scarce b**	Southern Restricted	Infrequently found. Inhabits a variety of habitats, from chalk downland to heaths. Prey, small caterpillars. Aerial and ground nesting.	✓		✓	
Vespa crabro	None	Southern Widespread	Locally frequent. Associated with areas of old trees, in which it often nests.	✓			✓
Vespula germanica	None	Universal	Very commonly found. Underground and cavity nesting.			✓	✓
Vespula vulgaris	None	Universal	Very commonly found. Underground and cavity nesting.			✓	✓

SPHECIDAE DIGGER WASPS

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Astata boops	None	Southern Restricted	Locally common in bare, sandy localities. Preys on shieldbug nymphs. Ground nesting.				✓
Dryudella pinguis	None	Universal	Infrequently seen. Dry, sandy places. Preys on shieldbug and Lygaeid bug nymphs. Ground nesting.	✓			
Tachysphex pompiliformis	None	Universal	Locally common. Sandy places. Preys on grasshopper nymphs and adults. Ground nesting.	✓			
Ammophila sabulosa	None	Southern Widespread	Commonly found. Associated with sandy, and many coastal, localities. Hunts caterpillars. Ground nesting.	✓			
Spilomena beata	None	Southern Widespread	Infrequently found, but it is very small. Nests in small beetle burrows in dead wood. Preys on thrips (Thysanoptera).			✓	
Spilomena troglodytes	None	Universal	Infrequently found, but it is very small. Nests in small beetle burrows in dead wood. Preys on thrips (Thysanoptera).			✓	
Cerceris arenaria	None	Southern Widespread	Locally common in sandy places. Preys on *Otiorrhynchus* weevils. Ground nesting.	✓			✓

Cerceris rybyensis	None	Southern Restricted	Locally common. Heathland and downland. Preys on various solitary bees. Ground nesting.	✓			✓
Crabro cribrarius	None	Universal	Locally frequent in sandy localities. Preys on flies. Ground nesting.	✓		✓	
Crabro peltarius	None	Universal	Locally common in sandy localities. Preys on flies. Ground nesting.	✓			
Crabro scutellatus	**Nationally Scarce a**	Southern Restricted	Locally frequent. Preys on dolichopids (Diptera). Damp heathland. Ground nesting.			✓	
Crossocerus annulipes	None	Universal	Locally common. Preys on Homopteran bugs. Nests in dead wood.			✓	
Crossocerus elongatulus	None	Universal	Widespread, nesting in dead wood and the ground.		✓		
Crossocerus ovalis	None	Universal	Commonly found. Preys on small Diptera (Empids). Ground nesting.	✓			✓
Crossocerus podagricus	None	Universal	Commonly found. Hedgerows. Preys on small Diptera, especially Nematocera. Dead-wood nesting species.	✓		✓	✓
Crossocerus pusillus	None	Universal	Commonly found. Preys on small Diptera. Ground nesting.	✓			✓
Crossocerus quadrimaculatus	None	Southern Widespread	Commonly found. Preys on small Diptera. Ground nesting.	✓			✓
Crossocerus styrius	None	Universal	Rarely found. Associated with shady stream edges. Dead-wood nesting. Probably requires conservation status listing.				✓
Diodontus insidiosus	**RDB3**	Southern Restricted	Infrequently found. Likes dry, sandy heaths with short vegetation. Preys on aphids. Ground nesting.	✓			✓
Diodontus minutus	None	Southern Widespread	Commonly found in sandy places. Preys on aphids. Ground nesting.	✓			
Ectemnius cavifrons	None	Universal	Commonly found. Dead-wood nesting. Hunts flies.			✓	
Ectemnius continuus	None	Universal	Commonly found in a variety of habitats. Dead-wood nesting. Preys on flies.	✓			✓
Ectemnius lituratus	None	Southern Widespread	Commonly found. Dead-wood nesting. Hunts flies.				✓
Entomognathus brevis	None	Southern Widespread	Commonly found in sandy places. Preys on small leaf-beetles (Chrysomellidae). Ground nesting.	✓			
Harpactus tumidus	None	Universal	Infrequently seen. Local to warm sandy places. Preys on Frog-hoppers (Cicadellidae and Cercopidae). Ground nesting.			✓	
Ectemnius cephalotes	None	Universal	Frequently found. Dead-wood nesting. Hunts flies.			✓	
Mimesa bruxellensis	**Nationally Scarce a**	Southern widespread	A species of dry sandy places. It may prey on arboreal leaf-hoppers.	✓			
Mimesa equestris	None	Universal	Commonly found in sandy places. Preys on Homopteran bugs. Ground nesting.	✓			
Mimumesa dahlbomi	None	Universal	Frequently found. Preys on Homopteran nymphs. Dead-wood nesting.	✓			
Lestiphorus bicinctus	**Nationally Scarce b**	Southern Restricted	Very local; can be numerous where it occurs. Preys on froghoppers (Hemiptera Homoptera)			✓	
Lindenius albilabris	None	Universal	Commonly found. Preys on Mirid bugs or small Diptera. Nests in hard-packed bare ground.	✓			✓

Lindenius panzeri	None	Southern Restricted	Locally frequent. Sandy places. Preys on Chloropid flies. Ground nesting.	✓			
Nysson trimaculatus	**Nationally Scarce b**	Southern Widespread	Infrequently found, a cleptoparasite of *Gorytes* spp.				✓
Oxybelus uniglumis	None	Southern Widespread	Very commonly found in sandy places. Preys on flies. Ground nesting.	✓			✓
Pemphredon lethifera	None	Southern Widespread	Commonly found. Preys on aphids. Dead-stem nesting.		✓		
Pemphredon inornata	None	Southern Widespread	Commonly found. Preys on aphids. Dead-wood nesting.				✓
Pemphredon lugubris	None	Universal	Commonly found. Preys on large aphids. Nests in dead wood, especially as this becomes dry and powdery.			✓	✓
Philanthus triangulum	**RDB 2 pRDB4 -out of danger**	Southern Widespread	Locally common. The 'Bee Wolf'. Preys on honeybees. Long restricted to the south coast of the Isle of Wight as a permanent breeding population, this wasp has recently undergone a rapid expansion of its range.				✓
Psenulus pallipes	None	Widespread	Infrequently found. Associated with woodland and hedgerows. Preys on aphids and nests in dead wood.				✓
Rhopalum coarctatum	None	Universal	Locally frequent. Likes damp, often shady, places. Preys on small crane-flies. Nests in hollow stems.			✓	✓
Stigmus pendulus	None	Southern Restricted	Abundance: Infrequently found. , First recorded as British in 1986. Nests in dead wood Preys on Aphids.				✓
Stigmus solskyi	None	Southern Widespread	Frequently found. Preys on aphids. A woodland species.			✓	
Trypoxylon figulus s.s.	None	Southern Widespread	Infrequently found. Recent taxonomic research has shown that the old '*T. figulus*' is a mix of three species. This is the largest of the three and is distinctive in that it usually nests in cavities in walls and banks, rather than wood or dead plant stems. Hunts small spiders.	✓			
Trypoxylon attenuatum	None	Universal	Commonly found. Preys on small spiders. Stem nesting.				✓

COLLETIDAE

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Colletes daviesanus	None	Universal	Locally common, sometimes in extensive colonies on sandstone cliffs. Oligolectic on Asteracea.			✓	✓
Hylaeus communis	None	Southern Widespread.	Commonly found. Polylectic. Cavity nesting.				✓

ANDRENIDAE

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Andrena fulva	None	Southern Widespread	Locally common, often in woodlands and gardens. Polylectic.		✓		
Andrena bicolor	None	Universal	Very commonly found. Polylectic. Ground nesting.				✓
Andrena dorsata	None	Southern Widespread	Commonly found. Often the dominant species in southern Britain. Polylectic.				✓
Andrena flavipes	None	Southern Restricted	Commonly found. Forms very large colonies, especially in bare ground. Polylectic. Ground nesting.	✓			✓

Andrena florea	**RDB3**	Southern Restricted	Frequently found. Oligolectic, utilises White Bryony, *Bryonia cretica*, as its sole pollen source. Most often associated with sandy soils, nests in hard ground such as on tracks.	✓		✓	
Andrena haemorrhoa	None	Universal	Commonly found. Females nest singly but males often congregate on blackthorn and hawthorn blossoms. Polylectic. Ground nesting.		✓		
Andrena humilis	**Nationally Scarce b**	Southern Widespread	Infrequently found, rarely common where it does occurr. Oligolectic on Asteraceae, with a stong association with yellow flowers.	✓		✓	
Andrena scotica	None	Universal	Commonly found. Several females may share a common burrow entrance. Polylectic.		✓		
Andrena nigroaenea	None	Universal	Commonly found. Polylectic. Ground nesting.	✓			
Andrena subopaca	None	Universal	Commonly found, especially in clay woodlands. Polylectic. Ground nesting.	✓			
Andrena tibialis	**Nationally Scarce a**	Southern Widespread	Locally common. A large mid-spring species which seems most frequently found in sandy locations. Polylectic. Ground nesting	✓			
Andrena varians	**Nationally Scarce b**	Southern Widespread	Rarely found, a greatly declined species which is often associated with the flowers of rosaceous shrubs such as blackthorn and hawthorn. Polylectic. Ground nesting	✓			
Andrena wilkella	None	Universal	Frequently found in unimproved meadows. Oligolectic on Fabaceae. Ground nesting.	✓			
Panurgus banksianus	None	Southern Restricted	Locally frequent. Oligolectic, associated with yellow flowered Asteraceae (composites). Ground nesting.	✓			
Panurgus calcaratus	None	Southern Widespread	Locally frequent. Oligolectic, associated with yellow flowered Asteraceae (composites). Ground nesting.	✓			

HALICTIDAE

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Halictus tumulorum	None	Universal	Commonly found. A eusocial species. Polylectic. Ground nesting.	✓		✓	✓
Lasioglossum albipes	None	Universal.	Commonly found. A eusocial species. Polylectic. Ground nesting.				✓
Lasioglossum brevicorne	**RDB3**	Southern Restricted	Infrequently found. Confined to sandy grasslands and heaths in southern England. Possibly oligolectic on yellow Asteraceae (composites).				✓
Lasioglossum calceatum	None	Universal	Commonly found. A eusocial species. Polylectic. Ground nesting.	✓			✓
Lasioglossum fulvicorne	None	Southern Widespread	Locally common on more alkaline soils. Polylectic. Ground nesting.				✓
Lasioglossum lativentre	None	Southern Widespread	Infrequently found. Polylectic. Ground nesting.	✓			
Lasioglossum leucopus	None	Universal	Locally commonly found. Polylectic. Ground nesting.	✓		✓	
Lasioglossum leucozonium	None	Southern Widespread	Commonly found in a variety of habitats. Polylectic. Ground nesting.	✓			✓
Lasioglossum malachurum	**Nationally Scarce a**	Southern Restricted	Forms large colonies. Formerly, a largely coastal species. Increased its range during the 1990s. Polylectic.	✓			

Lasioglossum minutissimum	None	Southern Restricted	Locally common. Associated with sandy places. Polylectic.	✓			
Lasioglossum morio	None	Southern Widespread	Commonly found. Polylectic. Ground nesting.				✓
Lasioglossum nitidiusculum	None	Universal	Rarely found. A scarce species, though widespread. It has declined greatly in abundance since the turn of the century.	✓			
Lasioglossum parvulum	None	Southern Widespread	Commonly found in a variety of habitats. Polylectic.				✓
Lasioglossum pauxillum	**Nationally Scarce a**	Southern Restricted	Locally common. Prefers sandy clays to nest in. Polylectic. Became much commoner during the 1990s. Ground nesting.				✓
Lasioglossum punctatissimum	None	Southern Widespread	Commonly found. Sandy places. Polylectic.	✓			
Lasioglossum villosulum	None	Universal	Commonly found. Polylectic. Ground nesting.				✓
Sphecodes monilicornis	None	Universal	Commonly found. Cleptoparasitic on *Lasioglossum* and *Halictus* sp.	✓		✓	✓
Sphecodes ephippius	None	Southern Widespread	Commonly found. Cleptoparasitic on *Lasioglossum* sp..			✓	
Sphecodes pellucidus	None	Universal	Commonly found in sandy situations where its host, *Andrena barbilabris*, occurs.			✓	
Sphecodes puncticeps	None	Southern Widespread	Infrequently found. Cleptoparasitic on *Lasioglossum* sp.				✓
Sphecodes reticulatus	**Nationally Scarce a**	Southern Restricted	Locally frequent. Associated with grasslands on light soils. Host species is unclear, as it is found where its recorded host, *Lasioglossum prasinum*, does not occur.				✓

MELLITIDAE

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Melitta haemorrhoidalis	**p Nationally Scarce b**	Southern Widespread	Infrequently found. Oligolectic. Associated with Harebell, *Campanula rotundifolia*, or Nettle-leaved Bellflower, *Campanula trachelium*. Ground nesting.			✓	
Dasypoda altercator	**Nationally Scarce b**	Southern Widespread	Locally common. Sandy areas. Oligolectic, associated with yellow Asteracea (composites). Ground nesting.			✓	✓

MEGACHILIDAE

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Chelostoma campanularum	None	Southern Widespread	Commonly found. Mainly associated with the flowers of *Campanula* spp. but may also utilise those of other, unrelated genera as pollen sources. Dead-wood nesting.	✓			✓
Chelostoma florisomne	None	Southern Widespread	Was considered very common by early collectors, now decidedly infrequent. Woodland and gardens. Oligolectic on buttercups, *Ranunculus* sp. Cavity nesting.	✓			
Heriades truncorum	**RDB3**	Southern Restricted	This species was previously thought to be dependent upon pine resin for building its nests, this is now known to be untrue as it has been found in areas with no pine, where it must be using other resins. Polylectic.				✓

Megachile centuncularis	None	Universal	Local. A species which has apparently declined greatly in the last hundred years. Polylectic. Cavity nesting.			✓	
Megachile ligniseca	None	Southern Widespread	Infrequently found. Dead-wood nesting. Polylectic.	✓			
Megachile versicolor	None	Universal	Commonly found. Cavity nesting. Polylectic.				✓
Megachile willughbiella	None	Universal	Commonly found. Cavity and ground nesting. Polylectic.				✓
Osmia leaiana	None	Southern Widespread	Infrequently found. Oligolectic on Asteracea.				✓

ANTHOPHORIDAE

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Anthophora bimaculata	None	Southern Restricted	Locally common in heathy localities. Nests in the ground. Polylectic.				✓
Anthophora furcata	None	Southern Widespread	Infrequently found. Associated with labiates. Nests in dead wood.			✓	
Epeolus variegatus	None	Universal	Commonly found in sandy localities. A cleptoparasite of *Colletes similis* and *C. daviesanus*.				✓
Nomada flavoguttata	None	Universal	Commonly found. Parasitises several *Andrena* species. Ground nesting.				✓
Nomada flavopicta	**Nationally Scarce b**	Southern Widespread	Infrequently found. A cleptoparasite of *Melitta* bees.			✓	
Nomada fucata	**Nationally Scarce a**	Southern Restricted	Frequently found. Becoming much more widespread recently. The host of this species, *Andrena flavipes*, has always been more widespread than the *Nomada*.				✓
Nomada goodeniana	None	Universal	Commonly found. Parasitises several *Andrena* species. Ground nesting.	✓			

APIDAE

Species	Conservation status	Distribution	Abundance	Yeo (1957)	Felton (1967)	Guichard (1972)	B & S (2003)
Apis mellifera	None	Universal	Abundant almost everywhere. A domesticated insect.	✓			✓
Bombus campestris	None	Universal	Frequently found. Breeds in nests of *B. pascuorum*.			✓	
Bombus hortorum	None	Universal	Very commonly found. Polylectic. Nests underground in cavities.			✓	
Bombus lapidarius	None	Universal	Very commonly found. Polylectic. Nests underground in cavities.		✓		✓
Bombus lucorum	None	Universal	Very commonly found. Polylectic. Nests underground in cavities.		✓		✓
Bombus pascuorum	None	Universal	Ver commonly found. Polylectic. Nests in surface litter.				✓
Bombus pratorum	None	Universal	Very commonly found. Polylectic. Nests underground as well as in aerial cavities, including nest-boxes.		✓		✓
Bombus terrestris	None	Universal	Very commonly found. Polylectic. Nests underground in cavities.		✓		✓
Bombus vestalis	None	Universal	Commonly found. Breeds in nests of *B. terrestris*.			✓	✓

During the survey undertaken by the authors, these paths provided the first observation of the spectacular RDB3 jewel wasp, ***Hedychrum niemelai*** (Plate 1). Its host species, the bee-hunting digger wasp ***Cerceris rybyensis*** (Plate 2) was present in good numbers along the paths, and the hyperactive jewel wasp was observed darting into and out of the nest holes of this species. Another RDB3 jewel wasp, the tiny metallic pink ***Hedychridium coriaceum*** (Plate 1) was also observed searching the paths for nest holes of its host, the digger wasp ***Lindenius albilabris***, which, like *C. rybyensis* excavates nest holes in hard-packed bare ground.

Even as far back as 1898, a tale of caution was provided by Fred Enoch, a well-known 19th century recorder, who observed with dismay the disappearance of bare-ground nesting species at Hampstead Heath when the bare paths were replaced with cinder paths. Enoch writes: "Last year I visited this locality several times, but not a single *Cerceris* did I find" (Guichard and Yarrow, *loc. cit.*).

Figure 3. Female Bee Wolf with prey locating hidden burrow.

Another species found on the bare paths was the **Bee Wolf *Philanthus triangulum*** (Plate 2). This species used to be one of the great British aculeate rarities, and a trip to the Isle of Wight was required to observe this (formerly) RDB2 species (Shirt, 1987). Since the late 1980's, this species has experienced a major range expansion and can now be found as far north as a site in North Wales (Edwards, 1997). We were lucky enough to observe an aspect of the behaviour of this species, and watched a female returning to its burrow with a paralysed Honey Bee ***Apis mellifera***. The female hovered momentarily above a patch of bare sandy soil (the burrow had been covered prior to the hunting expedition), and then literally plunged into the soil, still holding the bee and digging furiously (Figure 3) until it had disappeared from view, which took approximately three seconds. (A fascinating study of how *Philanthus* finds its hidden burrow was undertaken by Nobel prize-winning naturalist, Niko Tinbergen (1972).) The nest holes of the Bee Wolf,

which can be over a metre long, are characterised by very obvious piles of excavated soil. Occasionally, when a bee-carrying female is disturbed, the prey is dropped, but it is apparently never reclaimed, and several desiccated bees were observed near the entrance of some burrows (Figure 4).

Figure 4. Discarded Honey Bee at the entrance of a Bee Wolf nest hole.

The thistle banks in the Park were very productive, and immediately produced one of our most spectacular bees, the mining bee ***Dasypoda altercator***, flying among the thistle heads, which was instantly recognised by its huge lemon-yellow pollen combs (Plate 2). As mentioned previously, this species was rediscovered in the London District at Bushy Park by Guichard in 1971, who stated that: "The present Middlesex record of an active colony right beside a well-frequented path where not a few children play on the adjacent sandy soil is most encouraging as an example of the powers of survival of a local burrowing bee."

At a very dry gravel site to the north of Leg-of-Mutton Pond, we found a bank that was riddled with burrows, which produced another species of jewel wasp, ***Hedychridium roseum*** (Plate 1). This species is a cleptoparasite of the impressive sphecid (digger) wasp, ***Astata boops***, which was also present, and we observed the jewel wasp

following this large species into its burrow. Both species appear to be recent colonists, as does the large and unmistakable *Hedychrum niemelai*, and it is unlikely that these species would have been missed by previous recorders.

Another interesting observation was made when a very strange-shaped wasp arrived at the hidden entrance of its nest hole. It was the digger wasp, ***Oxybelus uniglumis***... strange-shaped because it was holding its prey, a fly, on its sting while it re-opened its nest. (This behaviour is described in Yeo and Corbet, *loc. cit.*).

Figure 5. Hornets and other insects such as the Comma butterfly *Polygonia c-album* were observed taking sap from a freshly cut branch.

The woodland habitat produced the jewel wasps ***Chrysogona gracillima*** (RDB2, although this should be revised) and the metallic blue/green ***Trichrysis cyanea*** (Plate 1), and a few other woodland specialists including the **Brown Tree Ant *Lasius brunneus*** (Nationally Scarce a). However, it was an aphid covered Willow arbour near the Longford River on the other side of the Park that produced an unexpected number of woodland species. The honeydew produced by the large brown aphids, *Tuberolachnus salignus*, had covered the leaves of the arbour, making them irresistible to a myriad of insects, from the impressive hoverfly, *Volucella zonaria*, to the beautiful metallic violet woodland chrysid, ***Pseudomalus violaceus***. The **Hornet *Vespa crabro*** was also present, and this species was observed taking sap from a freshly cut Oak branch (Figure 5).

Conclusions

It is probable that the observation of certain species previously unrecorded from Bushy Park such as the sphecid wasps: *Astata boops* and *Philanthus triangulum*, and the jewel wasps: *Hedychrum niemelai* and *Hedychridium roseum*, reflect the dynamic changes that are afoot

Plate 1: The Jewel Wasps of Bushy Park. Main picture: David Baldock investigating the dead Oak tree that produced the jewel wasps, *Chrysogona gracillima* (RDB2) and *Trichrysis cyanea*. Clockwise from top left: Ruby-tailed Wasp *Chrysis ignita* (agg.); the rare and spectacular *Hedychrum niemelai* (RDB3); *Hedychridium roseum* (note, non-metallic abdomen); *Trichrysis cyanea*, a striking metallic green species associated with wood-boring aculeates; the diminutive metallic pink jewel wasp *Hedychridium coriaceum* (RDB3) was usually found at grassland/bare ground boundaries. Photos: Peter Sutton

Plate 2: Thistle candy. Main picture: David observing the throng of activity in a highly productive thistle bank. Clockwise from top left: *Dasypoda altercator* (Nationally Scarce b) rediscovered in the London Region at Bushy Park in 1971 after almost a century of absence; the Bee Wolf *Philanthus triangulum* (pRDB1 – out of danger), formerly one of the great aculeate rarities, is a recent addition to the Park's fauna; the formidable but docile Hornet *Vespa crabro* is the largest European social wasp species; the impossibly agile *Cerceris rybyensis* with a bee (*Lasioglossum* sp.) captured in flight. Photos: Peter Sutton

Plate 3: The magnificent British Lucanidae. Main picture: The Rhinoceros Beetle *Sinodendron cylindricum*. This pristine male specimen was part of a swarm flying on a hot summer afternoon at Shapwick Heath in Somerset. Clockwise from top left: Lesser Stag Beetle *Dorcus parallelipipedus*, a common species in Bushy Park; female Rhinoceros Beetle taking flight (Osbrooks woodland, Surrey); female Stag Beetle *Lucanus cervus* (Bushy Park), those mandibles can produce a nasty nip!; male Stag Beetle (Nationally Scarce b, BAP Priority species). From hapless white grub to freshly polished mahogany gladiator, a Bushy Park specimen of Britain's largest terrestrial beetle. Photos: Peter Sutton

Plate 4: Stag Beetle predation: a Toad among many *Lucanus cervus* remains found under fallen bark in Bushy Park. Photo: Peter Sutton

Plate 5: Male Stag Beetles fighting in a European forest. Photo: André P. J. A. Teunissen

Plate 6: The mating pair of *Drilus flavescens*, photographed on the footpath at Downe, West Kent, 13 June 2005, showing the huge disparity in size between bloated female and diminutive male.

Plate 7: Female of *Drilus flavescens*, photographed later, as she walked actively. The creature's full extended length was 23 mm.

Photos: Richard Jones (Plates 6 & 7)

regarding the mobility of species in response to climate warming. It is also likely that more species may colonise the Park if current climatic trends continue.

Bushy Park is an important site for a diverse aculeate fauna that includes a significant number of rare and threatened species.

The continuing success of these species at Bushy Park depends primarily on the appropriate management of acid grassland, bare ground habitats and woodland habitats in the Park.

Significant threats to the aculeate fauna of Bushy Park include:

- loss of bare ground habitat through inappropriate path building schemes
- loss of acid grassland habitat through bracken and scrub encroachment
- inappropriate woodland management, *e.g.*, to quote from the lowland wood-pasture/parkland UK BAP (*loc. cit.*): "Removal of veteran trees and dead wood through perceptions of safety and tidiness where sites have high amenity use..."
- inappropriate mowing regimes which can cause significant damage to *e.g.* populations of species which overwinter in dead herbaceous stems and seedheads (Harvey, 2000). (Reassuringly, the London Habitat Action Plan for acid grassland advocates the use of 'selective strimming' to maintain scrub-free grassland, as opposed to mowing, which has been known to cause the wholesale mortality of certain invertebrates, *e.g.* Stag Beetle *Lucanus cervus*)
- inappropriate tree-planting on habitat of conservation importance
- changes in grazing policy; lower or higher intensity grazing schemes may unduly affect habitat and biodiversity

The prospects for the continuing prosperity of aculeates in Bushy Park look promising. The Royal Parks Agency is the lead partner for the implementation of the Habitat Action Plan for acid grassland in the London region, and is uniquely placed to ensure that the objectives, actions and targets of this plan are met.

Sadly, the threat of continuing fragmentation, isolation and destruction of aculeate-rich "Thames Terrace" grassland sites is currently a matter of grave concern, particularly in the light of the disappointing response that these sites received from conservation bodies. Peter

Harvey (2000) discusses the fragmentation of "Thames Terrace" grassland sites in the East Thames Corridor "to the point of no return", where sites become too small and isolated to provide enough habitat for viable populations of certain species to exist.

With the continuing development of "Thames Gateway" sites, many rare and threatened species and habitats along the East Thames Corridor will be lost. In the light of such development, it is likely that the mosaic of acid grassland habitats found within the "Ham Radius" will become increasingly recognised as an important refuge for a significant number of rare and threatened species associated with the Thames Terrace invertebrate fauna. (Although they could clearly never support many of the species found at these sites such as the highly threatened **Shrill Carder Bee** ***Bombus sylvarum***).

Acknowledgements

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The Private Life of the Stag Beetle (*Lucanus cervus*)

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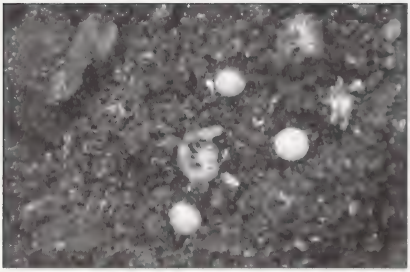
Introduction

The Stag Beetle (*Lucanus cervus*) is Britain's largest terrestrial beetle, and also probably one of the most easily recognisable. However, our knowledge of its biology and ecology has, until now, contained large gaps with much of the literature relating mainly to sightings of beetles. This is probably largely due to its subterranean life-style in the larval phase. This article seeks to fill in some of the gaps.

Egg laying behaviour

Although the female Stag Beetle will mate more than once during her reproductive phase lasting from late May to early to late August, she lays only one batch of eggs per year at the end of the mating season. Each egg is laid separately in the soil, near, but not in, rotting wood, and well below ground level. The female then typically dies under the ground near where she has laid.

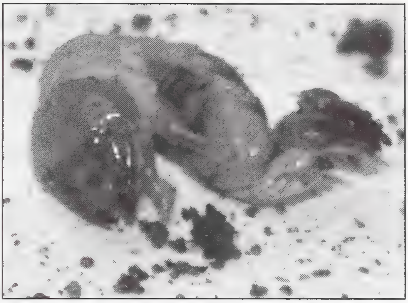
Burrowing behaviour is nevertheless common throughout the breeding season, with both sexes spending a considerable time below ground.



Newly laid eggs are approximately 3mm long, cream coloured and oval – the number will vary from around three to over twenty. Over the next three weeks, they will change shape and colour, becoming spherical and white, with the young larva clearly visible inside the egg.

Larval life

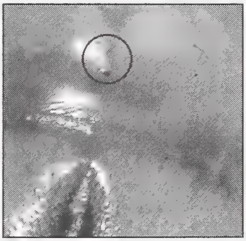
The first instar larvae hatch some three weeks after the egg is laid and are completely white, except for the small brown mandibles. Over the next 24 hours the head and legs will take on the characteristic orange colouration. The larvae then move towards the wood where they will begin to tunnel, making the familiar C- shape cavities.

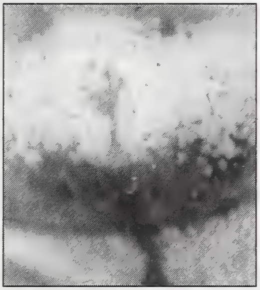


This first instar lasts until early January, when the first moult will occur. At this point the larva becomes very still and then sheds the skin from the head downwards.

Larval life is spent between the soil and the wood and lasts up to six years. There are five instars, although a few larvae may pass in to a sixth.

Even during this part of the life cycle, stag beetles show extreme variation in length, with those raised in the same stump showing a large variation in length both within and between instars.





During this phase it is extremely difficult to sex the larvae. However, it can be done by examining the last abdominal segments. Holding the larva so that its ventral surface is uppermost, there is a small triangular patch of chaetae on the last abdominal segment. Examination of the area slightly in front of this will reveal a small black spot in the male which is absent in the female.

Pupation

In the August of the final instar, the larva leaves the wood for the final time and makes a cocoon in the soil. This is the size of a chicken's egg and consists of soil and secretions. The larva then becomes still and empties the gut; the skin initially takes on a blistered appearance, progressing to resemble a covering of fine brown paper. This skin is shed to reveal the underlying pupa.

The pupal stage is the first during which the creature can be easily sexed, the male pupa possessing the large mandibles so characteristic of the male beetle.

greyer appearance through the skin, with the Lesser Stag having a paler, more pinky tinge to the contents of the gut.

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Shieldbug attacks Moth Pupa

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On 11th October, 2002 I came across a shieldbug larva on the washing in our garden in Banbury, Oxfordshire. Realising that it was nearly full-grown and assuming that it had fallen from the nearby hawthorn bush I thought it worth trying to rear it through to adult.

I duly placed it in a plastic box with a sprig of hawthorn. The following day I was sorting out some logs to place on our open fire when a Noctuid pupa fell on to the carpet. Without thinking I picked up the pupa and placed it in the plastic box with the idea of re-boxing it later.

I was then amazed to note that the previously dormant shieldbug larva immediately starting racing round the box with its rostrum held horizontally out in front. It looked just like a knight of yore and to my utter amazement it then headed straight towards the pupa, which it duly pierced with its rostrum. It then continued to run round the box with the pupa now firmly attached. This procedure continued for a minute or two until the larva came to rest. The pupa remained attached to the larva until the 14th October by which time the larva had expanded and the pupa showed signs of shrivelling around its wing cases. Towards the end of that day the larva withdrew its rostrum from the pupa, which it had clearly killed. The larva turned into an adult on 22nd October and has been identified as a specimen of *Troilus luridus* (Fabricius) of the family Pentatomidae.

Referring to Land & Water Bugs from the Wayside and Woodland Series I note that this species preys on the larvae of Lepidoptera and Coleoptera but there is no mention of the bug attacking pupae.

Reference

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The bizarre wingless female of the beetle *Drilus flavescens* (Geoffroy) (Coleoptera: Drilidae)

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The female of *Drilus flavescens* must rank as one of Britain's rarest insects – at least in reference collections. However, it must obviously be as widespread as the male, which occurs locally across chalk and limestone hills throughout southern England. The rarity of the female is usually put down to the fact that she is wingless, secretive and spends most of her time inside snail shells. However, the same can be said of the wingless female of the glow-worm, *Lampyris noctiluca* (Linnaeus), which is much more frequently found. I wonder whether oversight and misidentification might also be an important part of the reason for there being so few records.

I was very lucky to find a mating pair of this beetle, between Downe Bank and Overshaw (TQ439609), near the village of Downe, West Kent, on 18 June 2003. They were sitting, quite openly, on a curled bramble leaf on the narrow footpath. However, if the diminutive male had not been aboard the huge bloated female, I am not sure I would have known what I was looking at.

Before finding it, I did have a mental image of what I thought a female *Drilus* might look like, based on illustrations in various identification guides. However, none of the figures in these guides look like the actual creature and it is clear that the scarcity of females has prevented most natural history illustrators from accurately portraying what is a truly remarkable and distinctive creature.

The picture I most strongly remembered was that from the colour-plate edition of Fowler (1890). This same image was also used by Linssen (1959). It shows a pear-shaped, more-or-less uniformly coloured, larva-like, soft-bodied creature with paler first segment and relatively long legs. The texture of the body surface is ill-defined, but the whole thing is slightly reminiscent of the soft velvet-like skin of cantharid larvae (*Drilus* has sometimes been included in the Cantharidae in the past). But this illustration looks nothing at all like the female I found.

A quick skim through several books produced a series of equally unhelpful pictures. The colour-illustrated Continental works by Reitter (1911) and Schaufuss (1916) show a very similar drab-looking creature. The sketchy line figure in Joy (1932) is taken from the earlier work by Spry & Shuckard (1840) and is almost comical in its poor depiction.

Even the figure drawn by Crawshay (1903), looks hardly like the real thing, despite the fact that the author bred several females from larvae he found near Seaford, and went into some detail on the beetle's life history.

More recent books are no more likely to have accurate pictures. Geisthardt (1979) shows only an outline sketch figure. Harde (1984) shows a crisp colour picture, but of a rather flat and flacid looking creature. The artist who drew the illustration for Chinery (1986) probably used this image as a picture source, whilst Klausnizer (1981) and Bily (1990) show a similar image in black and white. Not one of these pictures looks remotely like the animal I had found.

Ironically, the most accurate depiction of the female *Drilus* is in the classic work by Westwood (1839) which predates all of the books quoted above and which seems to have been ignored or overruled by subsequent artists and illustrators. Admittedly, it is a simple wood engraving, but it most closely matches the insect I found at Downe. Perhaps doubt was cast on Westwood's illustrations after Bayford (1906) found the curious larva of *Drilus* at Folkstone and commented that the Westwood larva picture appeared to be incorrect. He fed his larva on small snails and eventually reared a female *Drilus*, but made no comment on its form.

There are three major discrepancies between published illustrations and the live female *Drilus*. In all the illustrations I have seen, the depiction of texture or sheen along the beetle's back is wholly unlike the real creature. In life, although the creature is soft bodied, it does not have the soft, matt, velvety texture implied by most pictures; there are sclerotized plates on each segment, appearing dark and shiny, and contrasting with the soft pale membranes between the segments. On the first three (thoracic) segments, these plates have a more distinctly angular outline at the outer corners.

Contrary to most illustrations, the outline of the female *Drilus* form is not smoothly regular. Each abdominal segment has a well-defined dark spiracle, beneath which is a fleshy, bluntly angular lobe, with a velvety texture. This gives the creature the appearance of being very caterpillar-like, as though it had the "false" prolegs that characterize Lepidoptera larvae.

However, the most glaring inaccuracy in almost all of the illustrations is the failure to show the great disparity in size between huge female and tiny male. In the pair I found, the massive and inflated female was 23mm long compared to a minuscule 5mm in the male. At a rough

guess, the female is something like 20 to 30 times more massive than her tiny suitor. Having said this though, Crawshay does state that he found females ranging from 30 down to only 8mm.

I take the opportunity of publishing, here, colour photographs of the mating *Drilus* pair, and the female, and hope that they will create a better search image for entomologists to memorize for the future. And I hope it might also jog a few memories of some strange beast found long ago, but never satisfactorily identified.

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The British Stag Beetle Family (Coleoptera: Lucanidae)

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Introduction

The Stag Beetle family (Coleoptera: Lucanidae) is a comparatively large group of beetles with over 1,200 named species worldwide. The Lucanidae are primarily associated with forest habitats in tropical regions, and consequently, only 18 members of this family are found in the more temperate climate of Europe (Baraud, 1993; Franciscolo, 1997). Four members of the Lucanidae have been recorded from the British Isles, of which one, the **Blue Stag Beetle *Platycerus caraboides*** is now regarded as extinct. The three extant British members of the Stag Beetle family are: the **Rhinoceros Beetle *Sinodendron cylindricum***, the **Lesser Stag Beetle *Dorcus parallelipipidus***, and the **Stag Beetle *Lucanus cervus***.

Concise and accurate information about these species is surprisingly hard to come by and is often prone to inconsistency. Jessop (1986), for instance, states that the Rhinoceros Beetle is "active at night" giving the impression that it is a nocturnal species, whereas Alexander (1999) correctly states that this species "Flies in daylight in early summer." (The male specimen in Plate 3 was observed flying on a hot afternoon in mid-June). There has also been a tendency for publications to repeat the same information, and certain words and phrases have become ingrained in this entomological literature. For example, the Rhinoceros Beetle is typically described as a species that "lives in rotten wood, especially Beech"; many authors believe that the Stag Beetle, whose larvae are commonly said to "feed on decaying Oak", is "declining in Britain"; and descriptions of the Lesser Stag Beetle often contain the obligatory, "resembles female Stag Beetle, lives in rotting stumps."

Of the three extant species, only the Stag Beetle has benefited from efforts to accurately map its British distribution. Recently, a very successful national survey coordinated by the People's Trust for Endangered Species (PTES) culminated in the production of maps which provide a remarkably detailed record of its distribution down to the 1km square level (Smith, 2003). There are currently no detailed maps available to show the distribution of the Rhinoceros Beetle or the Lesser Stag Beetle in Britain.

Keys for the identification of the extant British species (which are illustrated in Plate 3) are provided by Joy (1932) and Jessop (1986). This

article attempts to provide an overview of current knowledge regarding the status of these species in Britain.

The Blue Stag Beetle *Platycerus caraboides* (L. 1758) (see *Bulletin* cover picture)

There are no post-1900 British records for the Blue Stag Beetle (Shirt, 1987). Hyman and Parsons (1992) state that this species was formerly recorded from the counties of Berkshire, Buckinghamshire, Oxfordshire and South Aberdeenshire, and list the status of this species as: "Presumed extinct. Last recorded pre-1830 from Oxfordshire." Adults were usually recorded in June and July in Britain.

This species is associated with 'Urwald' (primeval forest) and in Latvia for instance, where it is not uncommon, it can be found in the shaded conditions of forests with complete or almost complete canopy cover. (Although this is the typical habitat of this species, it can also be found at the edge of forests and in isolated groups of trees where suitable habitat is present (Telnov, 2002)). This species probably did well in Britain in during the Mesolithic and Neolithic periods when the British Isles experienced a climatic optimum after a period of rapid amelioration 8,000 years ago. The final disappearance from its remaining relict populations in Britain was probably the end product of a process which began with the rapid deterioration of climate during the Bronze Age, coupled with an equally rapid period of forest clearance which has continued until the present time. Alexander (1999) states that there is fossil evidence for the presence of the Blue Stag Beetle in East Yorkshire up until the Bronze Age.

In mainland Europe, this species occurs mainly at low altitudes and has been recorded from Austria, Estonia, Finland, France, Italy, Latvia, Lithuania, Moldova, The Netherlands, Norway, Slovakia, Spain, Sweden and Switzerland (Mendez, 2003). *Platycerus caprea*, which also occurs in some of these countries, and with which *P.caraboides* can easily be confused, is generally found at higher altitudes. Harde (1998) states that *P. caprea* is "larger, more robust and longer than *P. caraboides*", occurring "in the middle and southern part of central Europe, chiefly in the mountains."

Stag Beetle *Lucanus cervus* (L. 1758) (Plate 3)

The Stag Beetle is the largest of the European coleopteran fauna, and the sole European representative of the genus *Lucanus*. It is the only

member of the British Lucanidae that is afforded conservation status, and is listed on: Annex II of the EC Habitats Directive; Appendix III of the Bern Convention; and Schedule 5, Section 9 of the Wildlife and Countryside Act. It is also categorized as a Nationally Scarce (B) species and is a UK Biodiversity Steering Group Priority Species (see Table 1).

There has been some discrepancy regarding the size of Stag Beetles, and measurements recorded for this species range between a lower limit of 20 mm (20 – 50 mm: Linssen, 1959) and a colossal upper limit of 90 mm (Zahradnik and Chvala, 1989). Recent work by Harvey and Gange (2003) has shown that there is wide variation in the size of the adult Stag Beetle in Britain, with males ranging from 35 – 75 mm (average size 50 – 55 mm), and females ranging from 25 – 47.5 mm (average size 35 – 37.5 mm). Rye (1866) makes the following interesting observation regarding the size of the Stag Beetle: "This species is not peculiar to the Oak, but is found sometimes on Willow; the specimens from the latter tree being smaller than the Oak-fed examples. It is, however, a well-known fact, that great differences in size are always found in species of which the larvae feed in wood; owing to the many variations to which they are subject, from the good or bad quality, or too great or too little moisture, of their food, and the long period during which they remain in the larval state."

In some parts of Europe, males with very short spiked mandibles have been found, and were once thought to represent a different species, *L. capreolus*. These individuals, which have been found in *e.g.* city parks in Prague and Vienna, are believed to occur as a result of poor development through lack of appropriate nutrition during the larval stage (Zahradnik and Chvala, 1989).

The remarkable sexual dimorphism exhibited by the male and female Stag Beetle can be seen in Plate 3, and it is the male that possesses the large spiked mandibles that give this species its common name. The males are known to "duel" for females, and although this behaviour is commonly observed in captivity, it is seldom seen in the wild, but undoubtedly occurs when two males are attracted to the same female. Plate 5 shows a wonderfully atmospheric picture of two males engaging in a 'contest' in a well-shaded European forest.

The female Stag Beetle could possibly be confused with the Lesser Stag Beetle, but there are several obvious differences between the two species. The most useful distinguishing characteristic is the number of spines or "teeth" on the middle and hind tibiae. The Lesser Stag Beetle has only one tooth, and the female Stag Beetle has three (Joy, 1932).

Linssen (1959) states that there is also an observable difference in the eye structure of each species: "*Lucanus* have an indentation extending to nearly half their diameter, but in *Dorcus*, it reaches almost entirely across the eye". The chestnut-red tinge of the Stag Beetle's polished elytra is also absent from the uniform black exoskeleton of the Lesser Stag Beetle.

Records show that adult Stag Beetles have been recorded in every week from early May to early October (Pratt, 2000), but this species is most frequently recorded in June and July. During this time of peak emergence, the adults may be present in numbers large enough to produce a "swarm". It is interesting to note that there are "few records of genuine plenty" for this species in Britain prior to 1934 (Pratt, 2003).

The adults feed on fruit and the sap produced by trees using their protrudable hairy yellow tongues, and this behaviour is discussed in the previous article by Harvey and Gange: *The Private Life of the Stag Beetle*, which describes the life history of the Stag Beetle. Predators of the Stag Beetle are also discussed, and Plate 4 shows a Common Toad *Bufo bufo* surrounded by Stag Beetle remains. These remains, which were part of a "hoard" found under a piece of bark where the toad was residing, were almost certainly the product of predation by the Grey Squirrel *Scuirus carolinensis*.

Stag Beetles begin to search for a mate in early evening and are most commonly seen flying at dusk. They can be attracted to light, and this activity also provides a common source of records. In times past, this species, which has long been associated with folklore in many countries, used to appear at charcoal burners. These observations led to the myth that the beetles would carry pieces of burning charcoal in their 'antlers', and set fire to the thatched roofs of houses. (Their mandibles appeared to glow orange in the light from the charcoal burners because of the translucent honeycombed nature of these hollow structures.)

Historically in Britain and Europe, Stag Beetles have been strongly associated with Oak trees and van Helsingden *et al.* (1996) noted that its European distribution was strongly correlated with that of *Quercus sp.* Mamonov (1991) also concludes that, "The typical biotope of this species are Oak trees as has been noted in all the literature dealing with this species." Although many authors have cited a range of deciduous and even coniferous trees as known larval food sources, one of the most interesting conclusions to be drawn from the 2002 National Stag Beetle Survey (Smith, 2003), was the degree of non-specificity regarding the nutritional requirements of Stag Beetle larvae. Specifically,

and to quote, "Provided that the wood has reached a suitable state of decay it would seem that Stag Beetles will breed in a range of wood or woody debris, sometimes in quite unusual situations." In the survey, Stag Beetle larvae were recorded from all number of sites from compost heaps to wooden ornamental planters, and "a total of 50 tree and shrub species were reported be associated in some way with Stag Beetles." To this list can also be added piles of sawdust, and adults have even been regularly recorded in potato stores (Pratt 2003).

In addition, the results of both surveys undertaken by the People's Trust for Endangered Species in 1998 (PTES, 1998) and 2002 (Smith, *loc. cit.*), show clearly that this species has the ability to exploit suitable habitat where favourable conditions prevail. Pratt (2003) states that "it has recently been rightly acknowledged that domestic gardens are currently the primary habitat for this species in this country, especially those situated in suburban districts."

Pratt (2000, 2003), who puts forward a convincing argument to explain the historically disjointed distribution of this species in Britain has performed an extensive and critical analysis of the habitat requirements of the Stag Beetle. It is clear that the Stag Beetle has a requirement for well-drained soils, a warm local climate, and has a strong predilection for low altitude sites (less than 30m above sea level) in areas with low annual rainfall. It is therefore no surprise that the largest of the four British "macro-colonies" is found on the gravel terraces of the Thames Basin in south-east England, and this species should certainly be regarded as part of the extraordinarily rich "Thames Terrace Invertebrate Fauna". (The remaining three macro-colonies are in East Anglia (south Suffolk north-east Essex); along the south coast (Hampshire to Kent); and in the Severn Valley.) Pratt (2003) postulates that the narrow ecological niche occupied by the Stag Beetle in Britain provides an explanation for its absence from areas that contain plenty of suitable habitat, and concludes that the strict climatic requirements of this species are almost solely responsible for its observed distribution and status history.

In the light of these requirements, particularly climatic dependence, and in view of the recent and spectacular climate-induced range expansions that have been experienced by some other invertebrates in recent years, the Stag Beetle would have been expected to increase its British range as new areas containing suitable habitat became climatically favourable. This has indeed been the case, with the slow but steady range expansion of the four British macro-colonies. This significant period of range expansion resulted in what was probably the

most extensive range enjoyed by this species since recording began over 150 years ago (although the "expansion" of the long-standing conglomeration of colonies in the Severn Basin, which can barely be called a "macro-colony", has been modest). In Sussex for example, this species has apparently been extending its range "for at least half a century, at an average rate of around half a mile per annum" (Pratt, 2000). This is clearly at odds with historical and contemporary opinion in British (and European) literature, and the misinterpretation of data by consecutive authors, which led to the belief that the Stag Beetle was declining in Britain during the 20th century is discussed by Pratt (2003).

After this significant period of range expansion, an apparent sudden and dramatic range contraction was observed between the period of the first and second PTES national surveys. It must be noted that the second (2002) survey was based on only 30% (2830) of the records received in 1998 (9381), but importantly, the proportion of records received from each county was very similar. This suggested that the lower number of records received was "not due to a lack of records or recorders from any one particular county" (Smith, 2003), and that a genuine contraction had occurred over much of the Stag Beetles British range. This contraction is illustrated in the 1km maps provided by Pratt (2003), and in some areas, recorders specifically commented on the newfound scarcity of the Stag Beetle in districts where it had formerly been regularly observed. There is a danger in drawing conclusions from a single "snap-shot" of records, particularly for a species whose abundance is known to fluctuate from year to year, and it is clear that further surveys are required to place this event into perspective. However, assuming that the observed range contraction is genuine, a satisfactory explanation has yet to be offered, and a meteorological explanation may provide an answer for this decline. During the period between the 1998 and 2002 PTES surveys, southern England experienced episodes of prolonged and often extreme wet weather. During those periods, the ground in some areas, particularly those associated with river catchments, became completely saturated, to the extent that even moderate rainfall caused flooding events over large areas of land, which remained submerged for significant periods of time. Where these events coincided with the distribution of Stag Beetle larvae, they may have had a bearing on the subsequent success of their subterranean development.

It must be stated again that although there appears to be a universally observed contraction across the Stag Beetles' British range, this conclusion should be treated with a degree of caution. It should

not be assumed that Stag Beetles, whether abundant or in depleted numbers, will be recorded if they are present at a site. In this respect, it would appear that few authors have considered the likelihood of obtaining records under different recording conditions. Climatic factors in particular require consideration, and Smith (*loc. cit.*) states that, "there will be a threshold temperature below which adults will not fly". Mamonov (*loc. cit.*) elaborates: "The flying beetles are most often observed in sunny, warm and especially dry weather when the temperature is around 23 - 25°C. They are very sensitive to an increase of humidity which will stop the mass flying. The imagos can remain active flyers even at lower temperatures than 20°C especially in July and even less towards the end of the season."

It is clear that when conditions are favourable, a veritable throng of Stag Beetle activity may be observed, resulting in a flurry of records not only from recorders, but also from the general public. Under more 'difficult' conditions, there may be almost no observable activity, with the same number of adults being infinitely more difficult to locate. Without the inevitable public participation of a "throng" year, records will depend on recorders being in the right place at the right time. Pratt (2000) offers an interesting account of his own experiences: "after ranging the country for almost 60 years by day and for 45 years with mercury vapour tungsten lights at night, I have only once seen *L. cervus*." During my own studies, particularly in Bushy Park, I have only encountered one male and one female, by chance, and fortuitously together under bark, in spite of the fact that I know, from fragments observed from predation by bats, birds and rodents (*e.g.* Plate 4), that it is not uncommon there. That this species has slowly increased its known British range over the last century is not in doubt. That the range of this enigmatic and oftentimes elusive wonder of nature has contracted dramatically, may be down to nothing more than a lack of observable activity during a poor summer, and underpins the requirement for further surveys to monitor its distribution.

Lesser Stag Beetle *Dorcus parallelipipidus* (L. 1758) (Plate 3)

The Lesser Stag Beetle is a black beetle that superficially resembles a small female Stag Beetle, but in addition to the differences described above, it is a more "oblong-shaped" and dorso-ventrally flattened species. The male Lesser Stag Beetle has a larger head than the female and there are also differences in the mandibles of each sex, the male having larger curved mandibles while those of the female are shorter and straighter. As with the Stag Beetle, and in common with many

saproxylic species, there can be considerable size variation in this species, with the typical range being between 20 and 32 mm (Jessop, *loc. cit.*).

Harde (1998) states that this is "the only member of this genus to be found in central and northern Europe, where it is widespread and often abundant". Zahradnik and Chvala (*loc. cit.*) state that it "is known over a large part of Europe from the south of Italy to the south of Finland and Scandinavia, in Asia Minor and North Africa." (Three other members of this genus are present in southern and eastern Europe: *Dorcus alexisi* (Cyprus: Muret and Drumont, 1999), *Dorcus musimon* (Italy: Franciscolo, 1997), and *Dorcus pieroni*). In Britain this species appears to be local but widespread. It is found in central and southern England, becoming less common northwards, and the generally accepted northern limit of its distribution is from Cheshire to south Yorkshire (Jessop, *loc. cit.*). It is also found in Ireland, and in Wales, it is very localised, notably occurring in woodlands near Cardiff (Ramsay, 2003).

The larvae of this species have been recorded from a range of deciduous tree species including: Oak, Willow, Poplar, Beech, fruit trees, Ash, Elm and other deciduous trees, but unlike the Stag Beetle, it has not apparently been recorded from coniferous trees. Alexander (1999) states that the larvae develop in various broad-leaved trees where it is being decayed by white-rot fungus. This species is typically encountered in decaying wood above ground level, whereas the Stag Beetle is found in suitable habitat below ground.

Adults have been recorded from April to October (Jessop (*loc. cit.*) states that this species can be found throughout the year), but are most commonly observed between May and July when they emerge to search for a mate. Like the Stag Beetle, this species begins to fly on warm summer evenings at dusk, is attracted to light, and also feeds on fruit and tree exudates.

The larvae, which can reach a length of 65 mm, are very similar to those of the Stag Beetle, and take several years to develop. They are cream-white grubs which have characteristically curved bodies, with well-developed legs and antennae. The rear end of the larvae lack cerci, and they are said to have sound-producing organs on their hind legs (Lyneborg, 1977). A key to the identification of the larvae of *Lucanus cervus* and *Dorcus parallelipipedus*, which includes illustrations of the diagnostic terminal segments of both species, is provided by Leiler (1950).

Rhinoceros Beetle *Sinodendron cylindricum* (L. 1758) (Plate 3)

The Rhinoceros Beetle is a distinctive shiny black species that, as its Latin name suggests, has a cylindrical-shaped body. The typical size range for this species is 10 – 18 mm (Jessop, *loc. cit.*). The male and female of this sexually dimorphic species can be distinguished by the shape of the head and pronotum. Only the male possesses the unmistakable 'horn', with the female having a very much-reduced structure, which is described by Jessop as a "single median tubercle". (The bristles that line the posterior side of the male's horn are clearly visible in the main picture in Plate 3). The anterior half of the pronotum in the male is characterized by a large depression, and the posterior ridge of this depression is usually lined with five small forward facing 'points' or protuberances, with the central dorsal point being the most pronounced. The anterior pronotum of the female is 'excavated' to a lesser degree, and has a much shallower depression. The head, thorax and elytra of both sexes are strongly punctured, and Plate 3 shows that, as per the description provided by Jessop, punctures on the elytra are "more or less arranged into rows." Linssen (*loc. cit.*) states that unlike the Stag and Lesser Stag Beetles, the eyes of the Rhinoceros Beetle are "entire". Jessop also states "that the upper side of the abdomen is red and clearly visible in flight." The abdomens of the male and female in Plate 3, which were observed flying in Somerset and Surrey respectively, were bright orange but both appeared to be very 'fresh' specimens whose colour may well have darkened to red with age.

Rhinoceros Beetle larvae have been recorded from the dead heartwood of a range of trees including: Oak, Beech, Lime, Ash, Birch, Alder, Sweet Chestnut, Hawthorn, fruit trees (*e.g. Malus, Prunus*) and even pine trees (*Pinus sp.*, (Alexander, 1999)), but are particularly well-recorded from Beech. Most authors agree that larval development takes two years, which is followed by the construction of the pupal chamber. The adult beetle emerges in autumn but spends the winter hibernating in the larval gallery. The adult exits through a round hole in early summer the following year, so complete development takes three or even four years depending on the conditions (ambient/nutritional) experienced by the larvae. The adults are usually observed flying between late May and July and like the other British lucanids, are known to feed on tree sap.

Chapman (1868) has documented the remarkable cooperative behaviour of the male and female Rhinoceros Beetle, which distinguishes this species from the other British Lucanidae (where males play no role in the egg-laying activities of the females.) Jessop (*loc. cit.*)

summarizes: "adults burrow into rotten wood, often in pairs, but sometimes a burrow is started by one individual and completed by a mixed sex pair. When digging as a pair, the female excavates the burrow and the male stands with his head directed towards (and closing) the entrance. The burrow is branched, and eggs are laid in these branches, which are packed with sawdust." Arrow (1951) explains the anatomical features of both sexes, particularly the structure of the spiked fore and hind legs, in terms of their function for the excavation of these burrows.

The Rhinoceros Beetle's strong association with Beech trees is intriguing. Beech, although it has been extensively planted and naturalized elsewhere, is typically found in the lowland woodlands of south-east England, the Midlands and south Wales, and was one of the last tree species to invade Britain prior to its isolation from mainland Europe. The Rhinoceros Beetle, being the most widespread of the British Lucanidae, and the only species to be found in Scotland, clearly arrived with pioneering species such as Birch, and is still associated with these species in northern districts. Angus (1964) has reported the presence of this species in Scotland and describes it as being "abundant" in Alder in East Inverness, and in rotten Birch in Morayshire. However, it must also be noted that in the Clyde Valley, this species has been found only in mature Beech (Ramsay, 2003).

The Rhinoceros Beetle is described as being widespread but local (often extremely so in northern districts), and has been recorded from suitable habitats in England, Scotland and Ireland. There is a paucity of data for Wales, but Fowles (pers. comm.) indicates that it is localised but not uncommon. A notably site is woodland (containing Beech, Ash and Elm) on the limestone slopes of the Alun Valley in Clwyd (Fowles, 1994). On the Continent it is described as being "distributed over a large part of Europe and western Siberia" by Zahradnik and Chvala (*loc. cit.*), who state that, "As a result of destruction of its habitats and the length of its development, this beetle is becoming rarer from year to year." Harde (*loc. cit.*) also states that "it is a local species which is rare and hard to find."

Of the three extant British lucanids, this species has the strongest association with ancient woodland, although it is not dependent upon this habitat. As such, it is regarded as an indicator species for ancient woodland, but is afforded AW3 status (see Table 1). (There are three categories for ancient woodland indicator species, AW1 to AW3, which are indicative of the 'faithfulness' of the species to this biotope, AW1 being the most 'faithful' (Harding and Wall, 2000).)

The conservation status of the British Lucanidae

The three extant members of the Lucanidae are an important part of the British saproxylic fauna. The conservation importance of this fauna has been the subject of previous discussion (Sutton, 2002):

> "Saproxylic fauna are species that are dependent, during some part of their life-cycle, on habitats provided by the wood decay process. There are over 1,700 species of invertebrate in the UK which depend to a lesser or greater extent on decaying wood habitat for the successful completion of their lifecycle. This number represents 6% of the total UK invertebrate fauna (Alexander, 1999). (Coleoptera form a major component of this number, and the 700 or so species of saproxylic beetle constitute 17% of the total UK beetle fauna.) Probably the most important statistic of all, is that 38% of invertebrates associated with decaying wood habitats have conservation status, and among these species of conservation concern, are included some of our rarest and most threatened species. Moreover, the UK is increasingly recognised as having the largest proportion (by far) of ancient trees north of the Mediterranean region (Green, 2001), and these trees provide habitat for many internationally important populations of these rare and threatened species."

The British Lucanidae are not listed in the Group Statement for Saproxylic Beetles (JNCC, 2001), but are nevertheless recognised as part of the most threatened invertebrate fauna in Europe (Speight, 1989).

As such, the primary threat to these species is the continuing loss of woodland habitat. The conservation measures required to ensure the continued existence of suitable woodland habitat, particularly the ancient/old tree resource, are discussed by Hyman and Parsons (*loc. cit.*) and the UK Habitat Action Plan for Lowland Wood Pasture Parkland (JNCC, 2001a). A summary of the conservation status of the British Lucanidae is provided in Table 1.

Table 1: The conservation status of the British Lucanidae

Species:	Rhinoceros Beetle *Sinodendron cylindricum*
UK status:	None
European status:	None
Ancient woodland indicator species:	AWI3 (associated with, but not restricted to ancient woodland)
Saproxylic Quality Index (SQI): rarity score:	2

Species:	Lesser Stag Beetle *Dorcus parallelipipidus*
UK status:	None
European status:	None
Ancient woodland indicator species:	Not listed
Saproxylic Quality Index (SQI): rarity score:	2

Species:	Stag Beetle *Lucanus cervus*
UK status:	Nationally Scarce, B; UK BAP Priority Species; Wildlife and Countryside Act Schedule 5 (taking and sale)
European status:	EC Habitats Directive Annex IIa; Bern Convention Appendix III
Ancient woodland indicator species:	Not listed
Saproxylic Quality Index (SQI): rarity score:	8

Species:	Blue Stag Beetle *Platycerus caraboides*
UK status:	RDB Appendix, Extinct
European status:	None
Ancient woodland indicator species:	Not listed (AWI1?)
Saproxylic Quality Index (SQI): rarity score:	32

Table 2: An explanation of rarity scores (Fowles *et al*, 1999)

Score	Status
1	Common
2	Local
4	Very Local/Uncertain
8	Nationally Scarce B (thought to occur in between 31 and 100 10km squares of the National Grid)
16	Nationally Scarce A (thought to occur in 30 or fewer 10km squares of the National Grid)
24	Red Data Book RDBI, Indeterminate / Red Data Book RDB3, Rare
32	Red Data Book RDB1, Endangered / Red Data Book RDB2, Vulnerable / Red Data Book RDB Appendix, Extinct

Further information

For further information about Stag Beetles and related issues, the following web-sites are recommended:

www.ptes.org, the web-site for the People's Trust for Endangered Species, includes Stag Beetle project and useful survey information;

www.coleopterist.org.uk, for pictures of all three British species which form part of an extensive and high-quality photo-gallery of British beetles;

http://entomologia.rediris.es/gtli/espa/cuatro/G/europa.htm, Marcos Mendez/gtli European Stag Beetle site;

http://www.woodland-trust.org.uk/ancient-tree-forum/atfgallery/gallerysection.htm, ancient tree forum;

www.david.element.ukgateway.net, for some superb pictures of Stag Beetles;

http://www.imagesofdorset.org.uk/StagB/stagover.htm, to hear what a flying Stag Beetle sounds like, pictures, and useful Stag Beetle links;

http://maria.fremlin.de/stagbeetles.html, discusses many Stag Beetle issues with excellent links to other relevant sites.

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Book Review

Shieldbugs of Surrey

by Roger D. Hawkins, published by Surrey Wildlife Trust 2003. 192 pp., 24 colour plates, distribution map for each species. Hard cover £15.00 (plus £2.40 postage & packing). ISBN 0-9526065-7-7. Available direct from Surrey Wildlife Trust, School Lane, Pirbright, Woking, Surrey, GU24 0JN, Tel: 01483 488055, E-mail: surreywt@cix.co.uk.

Although this book is essentially the record of a survey conducted by the author between 1976-2002, it is so much more than merely an account of the shieldbugs recorded from Surrey. It includes simple, precise, clearly illustrated keys to almost every British species, plus keys to 23 additional species in five families: Alydidae, Coreidae, Pyrrhocoridae, Rhopalidae and Stenocephalidae not generally listed under the heading of "shieldbugs".

Within the Introduction, in addition to the keys to species, there are sections dealing with the geography and geology of Surrey, the structure, life history, migration, collection and conservation of shieldbugs, useful addresses, acknowledgements and explanation of species accounts. In fact almost every aspect of the study and conservation of shieldbugs is covered. The beautiful set of colour plates comprise more than 100 photographs of eggs, and nymphs and adults. Two thirds of the book is taken up by detailed species accounts of the 46 species recorded from Surrey. There are more than 60 bar charts illustrating the months of peak activity for adults and nymphs and a distribution map for almost every species, showing a dot for each tetrad (2-kilometre square) where records exist for the period of the survey. The appendices comprise nine pages of references, a gazetteer of grid references to Surrey sites and a short glossary. There are three indexes: "Plants, with scientific names", "Shieldbugs and allies (scientific names)" and "other insects".

The shieldbug *Jalla dumosa*, recorded from East Kent towards the end of the 19th Century, has been omitted from the key to species, although it is mentioned briefly in the text. However, it is almost impossible to criticise this excellent work and anyone with the remotest interest in bugs should find it both extremely useful and compelling to read. The author's style of writing is faultless and the book should form part of the library of every entomologist, whether a beginner or an experienced specialist.

Peter Hodge (5335)

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